Socio-Ecological Well-Being:

Resources at the Personality, Activity, and Community Level (Taylor's Version)

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by

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Dalhousie University is located in Mi'kma'ki, the
ancestral and unceded territory of the Mi'kmaq.
We are all Treaty people.

Dedicated to my tabby cat daughters: Mackenzie (Mac) and Nicola (Nic) Hill.

Loving you for the past ten years has been the greatest pleasure of my life.

You guys are my soulmates, my moon, and my sun.

"The good life is a process, not a state of being. It is a direction, not a destination. … This process of the good life is not, I am convinced, a life for the faint-hearted. It involves the stretching and growing of becoming more and more of one's potentialities. It involves the courage to be. It means launching oneself fully into the stream of life. Yet the deeply exciting thing about human beings is that when the individual is inwardly free, … [she chooses] this process of becoming."

(Rogers, 1961, pg. 186, 187, 196)

Table of Contents

List of Tables xi

List of Figures 13

Abstract xv

List of Abbreviations and Symbols Used xvi

Acknowledgements xvii

Chapter 1 Introduction 1

Positive Psychology: The Scientific Study of Well-Being 1

Common Conceptualizations of Well-Being 2

The Humanistic Movement 4

Psychological Well-Being 5

Self-Determination Theory 5

Connections Between Eudaimonic and Hedonic Well-Being 6

Flourishing: Combining Eudaimonic and Hedonic Well-Being 7

Individual Differences in Well-Being 8

Personality Traits and Well-Being 8

High Achieving People and Happiness 10

Models of Personality and Well-Being 11

Model 1: Basic Psychological Need Mini-Theory 11

Model 2: Sustainable Happiness Model 12

Model 3: Positive Activities Model 13

All Together: Personality-Driven Pathways to Well-Being Through Daily Life 14

Primary Objectives 15

Chapter 2: Relative Importance of Individual and Community Predictors of Well-Being 17

Abstract 19

Introduction 20

What is Well-Being? 21

Theoretical Justification for Selection of Predictive Factors 21
Rationale 23
Research Questions 23
Source of Data 23
Sampling Procedure 24
Survey Instrument 24
Data Weighting 25
Selected Measures 26
Well-Being Measures 26
Community Vitality 26
Healthy Populations 27
Time Use 28
Democratic Engagement 28
Environment 28
Living Standards 29
Demographic Variables 29
Data Analysis Plan 29
Results 30
Profile of Sample 30
Preliminary Data Analysis 30
Primary Data Analysis. Regression Models 31
Model 1. Multiple Regression Predicting Life Satisfaction 31
Model 2. Multiple Regression Predicting Life Worth 31
Discussion 32
Relatively Important Predictors of Variation in Well-Being 33
Mental Health 33
Neighbourhood Environment Quality 34
Time Adequacy 34
Sense of Community 34
Physical Health 35

Financial Security 35
Limitations and Future Directions 36
Implications 38
Conclusion 38
Chapter 3 From Universal Well-Being Factors to Identifying Personality-Driven Processes 46
Chapter 4 Crafting Happiness from Everyday Life: Personality, Personal Projects, Basic 49
Psychological Need Satisfaction, and Well-Being 49
Abstract 51
Self-Determination Theory 52
Well-Being 53
Personal Projects 55
Perfectionism and Achievement-Oriented Personality Traits 56
The Present Study 59
Method 60
Participants 60
Measures 61
Personal Project Analysis 61
Modified BPN Satisfaction Scale 62
Well-Being Measures 63
Personality Variables 64
Procedure 65
Analytic Plan 65
Missing Data 66
Results 66
Model 1: Competence & Positive Mental Health 67
Model 2: Competence & Zest for Life 67

Model 3: Competence & Life Purpose 68
Model 4: Competence & Passion 68
Model 5: Relatedness & Positive Mental Health 68
Model 6: Relatedness & Zest for Life 69
Model 7: Relatedness & Life Purpose 69
Model 8: Relatedness & Passion 69
Model 9: Autonomy & Positive Mental Health 70
Model 10: Autonomy & Zest for Life 70
Model 11: Autonomy & Life Purpose 70
Model 12: Autonomy & Passion 70
Discussion 71
Competence and Well-Being 71
Relatedness and Well-Being 73
Autonomy and Well-Being 74
Limitations and Future Directions 75
Conclusion 76
Notes 76
Chapter 5 What Makes a Personal Project Enjoyable? Characterizing the 'Positive' of Positive Activities 85
Chapter 6 It's the Little Things in Life: Enjoyment of Different Types of Personal Projects 87
Abstract 89
Frameworks: Sustainable Happiness Model and Positive Activity Model 91
Beyond Activities: Personal Projects 93
Rationale and Research Questions 94
Method 95
Sample Size Justification 95

Participants 96
Open Materials and Data 96
Personal Project Analysis 96
Procedure 97
Results 99
Content Coding and Descriptive Statistics 99
Project Enjoyment by Type 99
Repeated Measures Correlations 100
Multiple Regression 100
Discussion 101
Personal Projects Vary in Type and Enjoyment 101
Characteristics of Enjoyable Projects 103
Absorption: A New Avenue for Positive Activities? 105
Theoretical Contributions 105
Limitations 106
Future Directions 107
Conclusion 108
Chapter 7 All Together Now: Testing if Positive Activity Features Increase Achievement Strivers' Well-Being Over Time 115
Chapter 8 Focused, Flourishing, but not in Flow: Achievement Strivers' Experiences of Competence, Flow, and Well-Being During Personally Expressive Activities 118
Abstract 120
Theoretical Framework: Self-Determination Theory 122
Literature Review 123
Achievement Striving 123
Activities and Well-Being 123
The Flow State 124

Activities, Competence, Flow, and Well-Being 125
The Present Study 127
Method 128
Sample Size Determination 128
Participants 128
Measures 129
Achievement Striving 129
Well-Being 129
Personally Expressive Activities 130
Competence 130
Flow 131
Procedure 131
Analytic Plan 132
Results 135
Quantitative Analyses 136
Exploratory Analyses 137
Discussion 138
Achievement Strivers Tend to Feel Competent and Happy 138
Flow and Well-Being 139
Types of Personally Expressive Activities 140
Flow During Reading and Writing 141
A Few Statistical Addendum 142
Limitations 142
Future Directions 144
Conclusions 145
Chapter 9 Discussion 160
Summary of Findings Across Four Studies 160

Measurement and Methodological Nuances 161
Units of Analysis in Everyday Life: Activities and Projects 161
Aligning Positive Psychology Processes with Units of Analysis in Everyday Life 162
Happy Achievement Strivers or Happy People with High Standards? 163
Is Hedonic Happiness More Suited to Positive Psychological Intervention Than Eudaimonic Well-Being? 165
The Hedonic Adaptation Prevention Model 166
The Eudaimonic Activity Model 167
Positive Activity Prescriptions for Achievement Strivers 169
Lessons Learned 169
Balancing Richness with Pragmatism in Open-Ended Data Collection 169
Tempering Expectations of the Variation in Conscientious People's Daily Life 170
Limitations and Future Directions 170
Well-Being: An Outcome to Achieve or an Experience to Enjoy? 171
Methodological Limitations 171
Methodological Strengths 173
Future Directions 173
Concluding Thoughts on Well-Being 175
References 178
Appendix A: Survey Questionnaires 203
Appendix B: Supplemental Analyses From Chapters 6 and 8 227
Appendix C: Word Cloud of Open-Ended Data 238
Appendix D: Copyright Permissions for Published Manuscripts 241

List of Tables

Table 2.1 Descriptive statistics……40

Table 2.2 Multiple regression model predicting life satisfaction……...43

Table 2.3 Multiple regression model predicting life worth……...44

Table 2.4 Comparison of relative importance of independent variables predicting variance in life satisfaction and life worth……45

Table 4.1 Demographic characteristics……....78

Table 4.2 Descriptive statistics of key study variables……79

Table 4.3 Tests of indirect effects for the serial mediation model with personal project competence, competence BPN satisfaction, and well-being……..82

Table 4.4 Tests of indirect effects for the serial mediation model with personal project autonomy, autonomy BPN satisfaction, and well-being……83

Table 4.5 Tests of indirect effects for the serial mediation model with personal project relatedness, relatedness BPN satisfaction, and well-being……...84

Table 6.1 Types of personal projects……109

Table 6.2 Descriptive statistics of personal project dimensions……110

Table 6.3 Enjoyment level by project type……111

Table 6.4 Results of linear mixed model predicting project enjoyment from project type and project dimensions……112

Table 8.1 Socio-demographic characteristics……149

Table 8.2 Scale descriptives and internal consistency……151

Table 8.3 Types of personally expressive activities……157

Table A1 Results of supplementary linear mixed model with quadratic challenge and difficulty…227

Table A2 Standardized coefficients (cross-lagged panel model 1 SWL and flow)……...230

Table A3 Standardized coefficients (cross-lagged panel model 1 SWL and competence)……..232

Table A4 Standardized coefficients (cross-lagged panel model 2 EWB and flow) ……234

Table A5 Standardized coefficients (cross-lagged panel model 2 EWB and competence)……..236

List of Figures

Figure 2.1 Bivariate correlations among study variables……..42

Figure 4.1 Serial mediation model tested…….80

Figure 4.2 Bivariate correlations between study variables……....81

Figure 6.1 Repeated measure correlation matrix, adjusting for each participant rating three projects on each dimension…….113

Figure 6.2 Estimated marginal means, 95% confidence intervals, jittered dot plots, and post-hoc tests of enjoyment predicted by project type……..114

Figure 8.1 Proposed cross-sectional mediation model……...146

Figure 8.2 Proposed cross-lagged panel model…….147

Figure 8.3 Power simulations for individual and overall indirect effects based on $N = 346$……...148

Figure 8.4 Flow chart of participant attrition……150

Figure 8.5 Bivariate correlations between study variables……..152

Figure 8.6 Results of serial mediation model testing the indirect effect of achievement striving on life satisfaction (hedonic well-being) through competence and flow……...153

Figure 8.7 Results of cross-lagged model testing the indirect effect of achievement striving on life satisfaction (hedonic well-being) through competence and flow……154

Figure 8.8 Results of serial mediation model testing the indirect effect of achievement striving on life worth (eudaimonic well-being) through competence and flow…….155

Figure 8.9 Results of cross-lagged model testing the indirect effect of achievement striving on life worth (eudaimonic well-being) through competence and flow……...156

Figure 8.10 Level of flow at Time 1 by activity type……..158

Figure 8.11 Level of competence at Time 1 by activity type……..159

Figure 9.1 The eudaimonic activity model…….177

Figure A1 Scatterplot of personal project challenge and enjoyment reported in Chapter 6……228

Figure A2 Scatterplot of personal project difficulty and enjoyment reported in Chapter 6……229

Figure A3 Word cloud of personal projects reported in Chapter 6……....239

Figure A4 Word cloud of personally expressive activities reported in Chapter 8……...240

Abstract

Within positive psychology, research has flourished on the determinants, correlates, and consequences of well-being. Positive psychological functioning is best understood using a socio-ecological lens, as well-being is shaped by individual differences and the settings in which people live, work, and play. Personality functioning as a resource for well-being is based on research showing there are individual differences that are 'good for you.' Ambitious people organize their days with purpose, planning, and healthy behaviours. Theory predicts that ambitious people experience well-being by satisfying their basic psychological need for competence. This research describes the settings and contexts for well-being-promoting processes (e.g., community assets, personal goals, daily activities), and investigates how ambitious people experience well-being through engaging in activities embedded in ambitious goal pursuit. I use primary and archival data analyses grounded in open science principles, through cross-sectional (Studies 1-3) and longitudinal (Study 4) quantitative survey designs. In Chapter 2, analysis of the 2019 Nova Scotia Quality of Life Survey (N = 12,827) showed that autonomy (time adequacy, financial security) and relatedness (sense of community) were the top predictors of life satisfaction and life worthwhileness. In Chapter 4 (N = 327), achievement strivers pursued personal projects which satisfied their basic psychological need for competence which in turn increased their well-being (positive mental health, passion, zest for life, life purpose). In Chapter 6, personal projects that involved household maintenance were least enjoyable and social connection projects were most enjoyable, using the same data as in Chapter 4. Projects were most enjoyable when they provided a sense of autonomy, control, likelihood of success, progress, absorption, low difficulty, and low challenge (i.e., satisfy the basic psychological need for competence). In Chapter 8 (N = 346), an indirect effect from personality to well-being through flow and competence during personally expressive activities was not supported, but power simulations enabled the ruling out of small-to-medium effect sizes in the population. Overall, people experience well-being when their basic psychological needs are met; more specifically, achievement strivers are happiest when they feel competent in their activities and goals. These studies corroborate and extend various models in positive psychology.

List of Abbreviations and Symbols Used

Non-Statistical Abbreviations

APS-R	Almost Perfect Scale – Revised
BPN	Basic Psychological Need
CIW	Canadian Index of Wellbeing
ENS	Engage Nova Scotia
IPIP	International Personality Item Pool
MHC-SF	Mental Health Continuum – Short Form
QoL	Quality of Life
OSF	Open Science Framework
PAM	Positive Activity Model
PEAQ-S	Personally Expressive Activities Questionnaire – Standard form
PP	Personal Projects
PPA	Personal Project Analysis
SDT	Self Determination Theory
SMH	Sustainable Happiness Model
SOC	Sense of Community
WHO	World Health Organization

Statistical Abbreviations

AC_1	Gwet's measure of inter-rater reliability for dichotomous variables
ANOVA	Analysis of Variance
CFI	Comparative Fit Index
CI	Confidence Interval
FIML	Full Information Maximum Likelihood
ICC	Intra Class Correlation
ICC	Intraclass Correlation
lmg	Lindeman, Merenda and Gold method
LMM	Linear Mixed Models
M	Mean
MLR	Robust Maximum Likelihood Estimation
N	Number of participants / Sample Size
p	p-value for determining statistical significance
r	Pearson Product-Moment Correlation Coefficient
ri	Relative importance
RMSEA	Root-mean-square error of approximation
SD	Standard Deviation
TLI	Tucker-Lewis index
α	Chronbach's Alpha
β	Standardized regression coefficient (Beta)
K	Cohen's kappa
σ^2	Omega squared
χ^2	Chi-square statistic

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Chapter 1

Introduction

Positive Psychology: The Scientific Study of Well-Being

From ancient Greek philosophies on what a good life is, to the humanistic movement of the 20th century that emphasized a strengths-based lens to human functioning (Rogers, 1961), the study of well-being has grown exponentially (Diener et al., 2018; Rusk & Waters, 2013). Before the turn of the 21st century, psychological science was predominantly focused on alleviating distress and treating disorders; while invaluable, this is only one side of human functioning (Seligman & Csikszentmihalyi, 2000). To address the disproportionate empirical investigation into psychological ill-being, positive psychology was introduced and inaugurated into the American Psychological Association in 1998 (Peterson & Park, 2003; Seligman, Duckworth, et al., 2005). Since then, a major goal of positive psychology has been to advocate for the scientific investigation of positive functioning (Seligman, Duckworth, et al., 2005).

Early positive psychology research focused on simply adding more measurement of positive functioning, which evolved into 'second wave' positive psychology, concerned with understanding human suffering and ill-being using a positive lens (Lomas & Ivtzan, 2016; Wong, 2011). Because positive psychology has been misconstrued as simply positive thinking (and not worthy of scientific investigation; van Zyl et al., 2023), second wave positive psychology aimed to highlight the utility of applying a positive lens to what it means to be human (i.e., to suffer, find meaning in life, grow, develop resilience, and face mortality; Ivtzan et al., 2016). Second wave positive psychology recognizes the complexity of the human condition, and that positive and negative dimensions are intertwined and dynamic (Wong, 2011). More recently, third wave positive psychology has

responded to critiques of being overly individualistic, and began to focus on the role of positive contexts, including institutions and cultures (Lomas et al., 2021). The evolution and growth of the field showcases paradigmatic waves within positive psychology, wherein critiques are addressed with each successive wave. As van Zyl et al. (2023) recently described, positive psychology has seen "increased complexity and scholarly sophistication" (p. 2) that has strengthened the field over time.

Common Conceptualizations of Well-Being

There are numerous conceptualizations of the determinants, experiences, and outcomes of well-being. Well-being, broadly defined, can be thought of as "a sustainable condition which allows the individual or population to develop and thrive" (Ruggeri et al., 2021, p. 1). The World Health Organization (2004) offers a more nuanced, multi-dimensional definition of positive mental health, which reflects "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community." Notably, this conceptualization includes both individual and social dimensions, as well as positive feelings and functioning. The discipline of psychology, by definition, studies the psyche (i.e., the human mind) and is quite narrowly focused on internal processes (e.g., cognition). In my thesis, I apply a socio-ecological lens to the study of well-being, in that I consider influences on well-being beyond the individual. The socio-ecological perspective originated in the study of early child development when Bronfenbrenner (1979) identified nested systems ranging from the micro-to-macro-levels that influence the development and health of an individual. Applying a socio-ecological lens to well-being highlights the way in which systems operating at individual, family, community, and broader societal levels are interdependent and all influence well-being (Jenkins et al., 2023).

Ever since the scientific study of well-being emerged, the field of positive psychology has been rife with researcher's attempts to understand and measure what well-being is, who is

experiencing it, and how it can be increased. It may be surprising to know that only three textbooks dedicated solely to positive psychology exist, although the field has been blooming for more than two decades. Attempts to create a clear, cohesive body of knowledge on well-being has, in part, been hindered by the vast number of terms with conceptual overlap known as the jingle-jangle fallacy (e.g. (Britt et al., 2016; Fogarty & Perera, 2016; Higgs & Lichtenstein, 2010). The jingle fallacy, wherein a term is used for more than one concept, is a consequence of terms being poorly defined, or vaguely described. The jangle fallacy, wherein different labels are given to the same construct, or previously established concepts are repackaged to appear novel; for example, van Zyl et al. (2023) argued that researchers write about joy as indistinguishable from other hedonic concepts (e.g., positive affect). This issue is present in the entire science of psychology (Hagger, 2009), but at the very least, there is consensus on the existence of different types of well-being. Overall, positive psychologists generally agree that well-being is multi-faceted, can be increased in certain contexts, particularly for people with specific characteristics.

There are two prevailing traditions in well-being research: hedonia (the experience of satisfaction, enjoyment of pleasing activities, and absence of negative emotion) and eudaimonia (positive functioning via living in accordance with one's virtues and goals; Ryan & Deci, 2001; Waterman, 1993). Hedonia and eudaimonia shape people's pursual of well-being, such as motives for daily time use (Huta & Waterman, 2014; Peterson et al., 2005), in addition to being distinct experiences (e.g., hedonia feels good while eudaimonia reflects functioning well). Although conceptually distinct, people who report having higher hedonic happiness also tend to report having higher eudaimonic well-being (Gallagher et al., 2009; Joshanloo, 2016; Keyes et al., 2002) which has raised the question of how valuable the distinction is (Kashdan et al., 2008). Nonetheless, the field of positive psychology remains rightfully dedicated to understanding how and why hedonia and eudaimonia differ (Huta & Waterman, 2014) in the experience and pursual of, and motivation for,

well-being (Huta & Ryan, 2010; Ryan & Huta, 2009). In my thesis, I refer to hedonic well-being as 'hedonic happiness' to maintain distinction from eudaimonic well-being. I am particularly interested in eudaimonic well-being, which emphasizes "activities of the soul" (Ryff, 1989, p. 2) that are congruent with one's virtue (i.e., striving to realize our best possible self). Moreover, eudaimonia refers to the *process* of bringing those virtues to realization. This perspective fed into the humanistic psychology movement, which focuses on striving for self-actualization, and what it means to be human. Positive psychology is the natural progression of humanistic psychology and gave way for psychological well-being models and Self-Determination Theory (SDT).

The Humanistic Movement

Foundationally, Adler (1956) wrote that lifestyle and life goals are concerned with success, and people have individual values and attitudes associated with these life goals. Heavily reminiscent of eudaimonia, this perspective considers well-being as the active, creative, and selective choice of life opportunities congruent with what one values and hopes for (Adler, 1956). Maslow (1968) proposed that everyone is born with talents and potentialities, which when realized, lead to self-actualization (i.e., reaching your full, human potential). Peak experiences entail intensely positive emotions, which are uniquely human and are characteristic of being self-actualized (Maslow, 1968). Rogers (1961) believed that all humans are basically good, and are born with the tendency to evolve and grow into a fully functioning person. Here, a fully functioning person refers to being self-actualized, open to rich life experiences both negative and positive, and ultimately becoming their ideal selves (Rogers, 1961). Similar to peak experiences, Csikszentmihalyi (1990) wrote about optimal experiences, in which one achieves a state of flow through engaging in activities that are psychologically complex, balanced with one's skills, and provide a sense of competence (Rathunde & Csikszentmihalyi, 2006). Flow theory emphasizes the feeling of purpose in the pursuit of personally meaningful goals (Csikszentmihalyi, 1990). Overall, humanistic theories focus on positive qualities,

such as experiences of the human condition that make life worth living. However, humanists are criticized for being overly theoretical and vague, in that they proposed a multitude of concepts that were difficult to define, measure, and test. Accordingly, the second generation eudaimonic well-being theorists (e.g., Ryff, 1989; Sheldon & Elliot, 1999; Waterman, 1993) aimed to conceptually define and assess well-being, leading to the model of psychological well-being.

Psychological Well-Being

Ryff's (1989) model, originally known as psychological well-being, was concerned with measuring what it means to be a fully functioning person by measuring six dimensions (purpose, autonomy, growth, mastery, relationships, and self-acceptance). Empirical investigation showed that being psychologically healthy meant: a) feeling that one's life has meaning and direction (purpose); b) living in congruence with personal values and ideas (autonomy); c) capitalizing on personal resources, talents, and potential (growth)l; d) effectively managing life situations (mastery); e) experiencing intimate connections with others (relationships); f) and liking most parts of your own personality while accepting your own limitations (self-acceptance; Keyes et al., 2002; Ryff, 1989, 1995; Ryff & Singer, 1998, 2008). Collectively, these dimensions offer a marked contrast from the focus on feeling good, happy, or satisfied with life, and this model is now recognized as reflecting eudaimonic well-being. While the humanistic movement valued eudaimonia, early contemporary positive psychology research was mainly concerned with hedonic experiences of feeling good, only later evolving to also include the study of eudaimonia, or what makes life worthwhile.

Self-Determination Theory

The meta-theory developed by Ryan and Deci (2001) is based on the overarching premise that humans come to be innately active, intrinsically motivated, and oriented toward developing naturally. Within SDT, there are six mini theories that each describe an intersection between

motivation, personality, and well-being (Deci & Ryan, 2012; Ryan & Deci, 2001). Of most interest in this thesis, is the basic psychological need (BPN) mini-theory, which describes three ingredients for optimal psychological health (autonomy, competence, and relatedness) that function as basic needs to be satisfied within one's life. Autonomy (feeling free-willed), competence (feeling successful at a task), and relatedness (feeling connected to other people) are considered inherently human and universal, and essential for psychological growth; when satisfied, these needs boost well-being (Ryan & Deci, 2001). While Self-Determination Theory draws on similar constructs as Ryff's (1989) model of psychological well-being, SDT differs in how it situates the role of well-being. According to Ryan and Deci (2001), well-being is *fostered* by the concepts of environmental mastery (competence), autonomy, and personal relationships (relatedness). On the other hand, Ryff (1989) describes these concepts as elements of the experience of well-being, or defining characteristics.

Connections Between Eudaimonic and Hedonic Well-Being

Eudaimonic and hedonic dimensions of well-being are distinct, yet often related (Carlisle et al., 2009). One way to think about eudaimonic well-being is in terms of positive functioning, while hedonic well-being reflects having more positive than negative feelings. For example, positive psychologists tend to describe eudaimonic well-being as the process embedded in living a good life, through realizing ones' abilities and virtues, and striving to reach one's fullest potential (Lambert et al., 2015; Ryan et al., 2008; Waterman, 2007) and as a broader way of being in the world (Sheldon, 2016, 2018). One repercussion of considering eudaimonia as a way of life, is that daily life would entail challenging pursuits characterized by engaging in effortful, sometimes difficult, activity. In the short-term, negative affect may be experienced to the same degree as positive affect (or more), as part of the process in pursuing one's goals and increased long-term well-being (Higgins, 2006; Seligman, Steen, et al., 2005). Although increased long-term well-being is possible, and may be more effective than pursuing hedonic well-being (Sheldon et al., 2019), the process of getting there is

considered an investment of effort strife with risk of fatigue (Huta & Ryan, 2010). In fact, leading positive psychologists suggest that hedonic activity is required to rejuvenate oneself during the process of pursuing eudaimonic well-being (Huta & Ryan, 2010). Thus, while neither dimension singularly constitutes a complete understanding of well-being, both perspectives are considered fundamental, leading to researchers recommending using both a hedonic and eudaimonic approach for measuring well-being (Henderson & Knight, 2012; Huta & Ryan, 2010).

Flourishing: Combining Eudaimonic and Hedonic Well-Being

In keeping with the definition of positive mental health offered by the World Health Organization (2004) and quoted above, Keyes (2005, 2007) developed the Mental Health Continuum-Short Form (MHC-SF) to measure flourishing. Now the gold standard measure and known colloquially known as 'the flourishing scale,' the MHC-SF provides an overall score reflecting level of flourishing (i.e., positive mental health), as well as subscales of social, psychological, and emotional well-being. Similar to how depression is diagnosed (frequency-based criteria of anhedonia and maladaptive functioning), 'diagnosing' someone as flourishing (i.e., having positive mental health) requires at least six of the eleven signs of positive functioning (psychological and social items; eudaimonia) and at least one of the three signs of positive feelings (emotional items; hedonia). Empirical research has shown that when people have positive social, psychological, and emotional functioning, they flourish (Joshanloo, 2016; Keyes et al., 2002). Positive psychology researchers use the term 'flourishing' to reflect a more holistic conceptualization of well-being than solely individual dimensions (Huppert & So, 2013; VanderWeele et al., 2019). Flourishing combines hedonia and eudaimonia, by reflecting an overall experience of life going well (e.g., *feeling* both satisfied with life and *functioning* enough to live to the fullest; Rule et al., 2024), identified via positive psychological, social, and emotional functioning (Keyes, 2014; Keyes et al., 2002). Thus, a defining characteristic of flourishing is the integration of prevailing traditions of well-being.

Individual Differences in Well-Being

Given the conceptualizations of the determinants, experiences, and outcomes of well-being described above, a key question for positive psychologists is the type of person that is characteristically disposed to enjoy well-being. The link between personal characteristics (e.g., personality, motivation, values) and well-being may be the topic with the most attention in positive psychology. The idea of one's personal characteristics serving as a resource for well-being rests on the idea that there are individual differences that are reliably "good for you." For example, Causality Orientation Theory, a SDT mini-theory, argues that people differ in their natural disposition to have intrinsic motivation (i.e., autonomy orientation; Deci & Ryan, 1985a). Those who are higher in autonomy orientation tend to experience more interest and enjoyment with their occupational pursuits (Deci et al., 1991), are more likely to be self-actualized (Deci & Ryan, 1985a), and generally experience positive life outcomes (Hagger & Hamilton, 2021).

Personality Traits and Well-Being

Trait psychology is relevant to understanding individual differences in well-being, as it describes personality as being innate, enduring, and stable (Mccrae & Costa, 1994). The most well-supported and widely used taxonomy of personality traits is the five-factor model (McCrae & Costa, 1987), which organizes five personality dimensions (i.e., openness, conscientiousness, extraversion, agreeableness, and neuroticism) into more specific facets (e.g., achievement striving in conscientiousness; gregariousness in extraversion). McCrae and Costa (1999) later developed the Five Factor Theory of personality that described stable individual differences (i.e., the five dimensions) but also domain-specific features that are influenced by the environment, such as motivation and goals. A seminal study on personality and well-being suggested that people higher in extraversion who were lower in neuroticism tended to experience higher levels of positive emotion

and lower levels of negative emotion which improved overall feelings of life satisfaction (Costa & McCrae, 1980). The relationship was relatively weak ($r = .20$), although stable over time. Of course, given that affect (positive in extraversion, negative in neuroticism) shapes how one evaluates their life, this relationship is hardly surprising. Since that seminal study, the basic pattern has been replicated (Anglim et al., 2020). However, early meta-analytic studies showed that the relationship between personality traits and well-being was weak (DeNeve & Cooper, 1998); Diener (2009) showed the effect sizes on well-being were comparable in size to demographic characteristics such as…. Indeed, "instrumental theories" (p. 77) propose an indirect link from personality to well-being via the experience of life, from daily events to major events. This conceptualization would mean that a reliable way to experience well-being is by engaging in activities with certain features, such as those that are personally meaningful and not overly stressful (Little, 1989), yet inherently interesting (Waterman, 1993). This is particularly true when these activities draw on one's personality strengths (Diener & Seligman, 2002) that represent a person-activity fit (Lyubomirsky et al., 2005).

If well-being is conceptualized as an outcome that is achieved if one's life is going well, then it is also something malleable. Thus, one implication of conceptualizing well-being as an outcome is that interventions can be developed that might lead to sustainable improvements in well-being by modifying a person's life circumstances or activities of daily life (Lyubomirsky et al., 2005; Seligman, Steen, et al., 2005). Accordingly and at the larger scale, population surveillance of well-being would help identify socio-ecological influences that reliably shape well-being, so that policy decisions could be made to increase well-being at a population level (Diener, 2000; Diener & Seligman, 2004; Kahneman et al., 2004). If well-being is thought of as an outcome that reflects the conditions of one's life, there is tension with the burgeoning body of literature showing that well-being is relatively stable over time (similar to personality traits) and may even be unresponsive to changes in life circumstances (Diener, 2009). However, if well-being is conceptualized as the 'integral part of an

ongoing process" (Diener, 2009, p. 76) rather than an outcome, one would expect relatively strong effects of personality and comparatively weaker effects of situations. The subjective judgement of assessing how happy one is with the way life is going (i.e., self-reporting well-being) is influenced by affective state, or one's mood in the moment (Lucas & Diener, 2008). The subjectivity of this well-being judgement is functional: negative affect helps create the motivation that enables one to change the conditions in life that seem to not be going well. Similarly, positive affect is not simply an enjoyable experience when things go well, these feelings are functional in helping broaden one's psychological resources for the future (Fredrickson, 1998, 2001). Hence, theory and research indicate that negative affect does not disappear when life is going very well and positive affect does not stay strong forever, even when all important goals are achieved. The individual differences underlying these affective processes suggest that well-being may be a malleable component of personality that is driven by the person-environment interaction between basic tendencies and life experiences, known as characteristic adaptations (McAdams & Pals, 2006). Thus, personality must hold a central role in well-being research.

High Achieving People and Happiness

As described by Costa and McCrae (1999), conscientious people are characterized as striving for achievement, through having a "strong sense of purpose and high aspiration levels" (p. 143) that may manifest in developing technical expertise and a tendency to make long-term plans. Considered high achieving people, those high in conscientiousness are intrinsically motivated toward hard work and pursuing success (Drasgow et al., 2012), as well as engaging in healthy lifestyle behaviours and managing their health effectively (Hill et al., 2011). In general, the facet of achievement striving and its higher order factor conscientiousness (Costa & McCrae, 1999), have been considered 'healthy' or 'positive' because of the positive outcomes that conscientious people disproportionately experience,

relative to other personality traits. Conscientiousness predicts longevity even after controlling for gender, age, and education (Hill et al., 2011).

In daily life, high achieving people tend to engage in productive activities embedded in the pursual of their goals (Judge & Ilies, 2002) which makes them feel competent. Feeling competent feels good, at both a daily (state) and disposition (trait) level (Reis et al., 2000), particularly for those who strive for achievement. For example, conscientious people tend to report feeling like they are able to master their environment and have purpose to their life (Anglim et al., 2020). In fact, conscientiousness, and more specifically, achievement striving, has been considered a 'healthy' or 'positive' personality trait for both conceptual and empirical reasons. Conceptually, people who are conscientious have an internal toolkit for success, such as being resourceful and organized (Dudley et al., 2006), Empirically, conscientious people experience more daily positive emotion and meaning in life (Smith et al., 2013), with meta-analytic research over the last three decades showing a moderately strong relationship with purpose in life (Anglim et al., 2020; Steel et al., 2008; Strickhouser et al., 2017).

Models of Personality and Well-Being

In this first chapter, I will describe three models of personality and well-being that have specific premises about how personality strengths interact with environmental contexts to improve well-being.

Model 1: Basic Psychological Need Mini-Theory

Deci and Ryan (2001) proposed that three basic psychological needs (autonomy, competence, and relatedness) are ingredients for well-being. In depth descriptions of each BPN from Vansteenkiste et al. (2020) say that autonomy is concerned with one's volition and willingness, competence reflects the use of one's skills and expertise during an activity, and relatedness means

feeling connected and important to people. The foundational premise of BPN mini-theory is that there are person-environment interactions, which form the basis for theoretical predictions about people's motivation, personality, and behaviours, and the impact on well-being. That is, social environments act as contexts that facilitate or hinder the fulfilment of the three BPNs (Legault, 2017). One type of person-environment interaction is a person-activity fit (Layous & Lyubomirsky, 2014; Lyubomirsky & Layous, 2013); pursuing activities that provide a sense of competence, autonomy, and relatedness is associated with positive life outcomes (Adams et al., 2017). Conditions conducive to need satisfaction promote well-being, such as activities that draw on one's personality strengths. For example, when people effectively use their skills and expertise while completing an activity, they may experience feelings of effectiveness and mastery, which fulfills their need for competence. This is particularly powerful for boosting well-being, when one's personality strengths include being ambitious, driven, and valuing achievement.

Model 2: Sustainable Happiness Model

The Sustainable Happiness Model (SHM) identifies three broad determinants of hedonic happiness: genetics, life circumstances, and intentional activities (Lyubomirsky et al., 2005). The intentional activity category reflects anything people do and think in daily life which require some degree of effort to engage in, such as routines, habits, and practices. The SHM borrows from behavioral activation (a treatment protocol for depression; Hopko et al., 2003), which argues that people's experience of depression leads to 'a loss or lack of response contingent positive reinforcement' (Mazzucchelli et al., 2010, p. 106). People who are depressed tend to engage in fewer pleasant activities, and experience less positive reinforcement compared to those who are not depressed (MacPhiliamy & Lewinsohn, 1974 as cited in Mazzucchelli et al., 2010). Thus, a treatment for depression was developed that guides patients to re-engage with pleasant activities in order to improve well-being. Relatedly, the idea of the SHM is that people can engage in daily positive

activities which, when enacted with effort and purpose, can reliably improve hedonic happiness (Sin & Lyubomirsky, 2009). Recognizing that genes and personality traits can maintain happiness levels relatively consistently, engaging in happiness-boosting activities (e.g., visualizing one's best possible future self, writing gratitude letters (King, 2001; Seligman, Steen, et al., 2005; Sheldon & Lyubomirsky, 2006) has the potential to improve levels of hedonic happiness for significant periods of time (Lyubomirsky et al., 2005). Notably, this model is particularly focused on hedonic happiness (i.e., increasing positive affect via positive psychological intervention), and less focused on improving long-term eudaimonic well-being (i.e., positive functioning).

Model 3: Positive Activities Model

An offshoot of the Sustainable Happiness Model, the Positive Activity Model (PAM) describes how, when, why, and for whom positive activities boost well-being (Layous & Lyubomirsky, 2014; Lyubomirsky & Layous, 2013). This model describes characteristics of positive activities that make the practice more (or less) effective in increasing happiness, based on a person-environment interaction. Activity characteristics (e.g., frequency, novelty/ variety), person characteristics (e.g., effort, motives, beliefs), and the interaction between the two (i.e., person-activity fit) create the conditions through which happiness is boosted (e.g., conditions promoting need satisfaction). For example, when activities are well suited to one's personality strengths, the boost in well-being can be explained by need satisfaction. In the context of this thesis, we might expect achievement strivers to pursue competence-promoting activities which satisfy their basic psychological need for competence, and produce a happiness boost.

Taken together, these models describe the specific mechanisms in which people can experience improved well-being by structuring their time (on a daily activity and a broader goal level) in a way that creates the conditions for their personality strengths to be a resource. Moving forward, I will refer to hedonic well-being as hedonic happiness, to make the distinction from eudaimonic

well-being (positive functioning) clear. Ultimately, my goal is to understand how high achieving people experience well-being (feel good and function well) through engaging in activities associated with the pursual of highly ambitious goals.

All Together: Personality-Driven Pathways to Well-Being Through Daily Life

Research suggests that many associations between personality traits and happiness levels are mediated, to some extent, by the specific happiness-boosting strategies (Tkach & Lyubomirsky, 2006). When simple positive activities are practiced using specific timing and variety features previously identified as optimal (Sheldon et al., 2013), lasting boosts in well-being are possible. That is, the boost in well-being will not wear off entirely with the passage of time. The idea of happiness boosts being only temporary comes from the hedonic treadmill model where any efforts to improve happiness are doomed: positive states are always transitory, and people revert back to their original hedonic set point (Frederick & Loewenstein, 1999). However, the resulting scholarly debate included the development of the hedonic adaptation model (Diener et al., 2009), which draws on evidence that happiness boosts derived from activities are characterized by features that may combat adaptation (unlike circumstance-based change). These features are episodic and novelty/variety. First, intentional activity is episodic and requires thought put to timing. Both frequency and length of time are important features that can shape the success of simple positive activities in boosting happiness. Any given individual may discover optimal timing for each activity they practice, particularly in terms of frequency (not so often that it becomes boring and a chore, but often enough that it remains enjoyable). Variety in one's simple positive activities practiced daily predicts slower rates of hedonic adaptation to those experiences; being able to continually vary the types of activities engaged in can help reduce adaptation to the activity, which enables that activity to maintain its potency (Sheldon et al., 2013). This is because adaptation does not occur to stimuli that are novel or malleable, but only to the stimuli that are constant or repeated (Frederick &

Loewenstein, 1999). Indeed, positive psychology research has highlighted the role of novelty/variety in well-being (Bagheri & Milyavskaya, 2020; Kashdan & Silvia, 2009; Okabe-Miyamoto et al., 2023). Based on this evidence, intentional activity seems the most promising route for increasing sustainable happiness. While the activity route assumes that people are able to initiate and commit to happiness-boosting strategies with effort, activity-based features (e.g., frequency and novelty) are, by definition, easier for one to influence relative to genes and demographic characteristics.

Primary Objectives

The primary objective of my dissertation is to test the processes through which high achieving people experience well-being through engaging in activities associated with the pursual of highly ambitious goals. To achieve this objective, I used primary and archival data analyses grounded in open science principles, using cross-sectional (Studies 1-3) and longitudinal (Study 4) quantitative survey designs, which are described in the following chapters:

Chapter 2: As baseline knowledge to frame this research, I took advantage of a local representative dataset with a large sample size (N = 12,827) and wide scope (230 questions) to identify which dimensions are most important to well-being. I found that well-being (hedonic and eudaimonic) was linked to autonomy (adequate time to do the things you want to do and adequate resources to nurture your lifestyle) and relatedness (sense of community).

Chapter 4: With personal needs for autonomy and relatedness in mind, I looked at the mid-range of daily life – the activities people engage in (personal projects). I showed that pursuing core life projects in a personality-congruent way made it more likely to meet basic psychological needs, thereby boosting well-being.

Chapter 6: Building on Chapter 4 - which showed a consistent pathway from personality to core life projects – I aimed to test the relationship between activity types, activity features, and well-being; I wanted to identify what types of personal projects individuals engage in and the project

dimensions that contribute to enjoyment across these project types. I found that people tend to take part in seven different types of personal projects and that not all types of personal projects are equally enjoyed. More specifically, people engaged in various types of activities which were enjoyed to different extents (relationship-strengthening activities were most enjoyable and household projects least enjoyable). Characteristics of enjoyable projects were autonomy, control, likelihood of success, progress, absorption, low difficulty, and low challenge.

Chapter 8: I build on the finding that everyday activities vary in enjoyment, by testing if improvements in well-being persist over time after engaging in personally expressive activities that promote competence and flow. I showed that people reported highest levels of flow in reading and writing activities, but competence was comparable across types. While achievement strivers tended to feel happy and competent at these activities, I did not find evidence that well-being was boosted by feeling competent and in flow during personally expressive activities, cross-sectionally or longitudinally; the mechanistic pathway to well-being is not yet clear.

Chapter 2

Relative Importance of Individual and Community Predictors of Well-Being

Taylor Hill developed the research questions, obtained access to these data for the purposes of this study, and acquired an ethics review at Dalhousie University for the use of secondary data. Taylor completed all of the literature review for this manuscript, as well as the statistical analyses and writing. She received feedback on the analytic approach and editorial comments from the study's co-authors (i.e., Taylor's dissertation supervisor, Dr Sean P. Mackinnon, and Dr. Bryan Smale). This manuscript underwent editorial and peer review, and is first published in International Journal of Community Well-Being, Volume 6, Issue 3, 2023, by Springer Nature. The journal citation for this manuscript is:

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Relative Important of Individual and Community Predictors of Well-Being

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Abstract

Inspired by theory in well-being science, we examined the relative importance of lifestyle factors and living conditions when predicting two dimensions of well-being (hedonic and eudaimonic) in a representative sample of 12,826 participants from Nova Scotia collected in 2019. Using multiple regression and measures of relative importance based on the Lindeman, Merenda and Gold (lmg) method, we identified which variables are most important to predicting life satisfaction and life worth. Twenty-two predictors accounted for 51% of the variance in life satisfaction, of which six accounted for 40% of the variance: self-rated mental health (11%), time adequacy (8%), satisfaction with natural environment (7%), sense of community (5%), financial insecurity (5%), and self-rated physical health (3%). These variables were also the top predictors of life worthwhileness, although all 22 predictors (R^2 = .42) and these six predictors (R^2 = .26) accounted for less variance than for life satisfaction. These results show that both community-level (i.e., environmental quality of neighbourhood, sense of community) and individual-level (i.e., mental health, time adequacy, financial insecurity, and physical health) factors are substantial predictors of well-being. The effect sizes differ between the hedonistic and eudaimonic dimensions of well-being, suggesting there may be important predictors of eudaimonic well-being not accounted for. This study may inform where community-level programming and policy could focus resources more effectively to promote well-being for individuals and their communities.

Keywords. well-being, healthy communities, life satisfaction, relative importance, life worth, Nova Scotia

Relative Important of Individual and Community Predictors of Well-Being

Introduction

A common refrain in psychological research is that most thoughts, feelings, and behaviours are products of a multiplicity of competing factors. When studying well-being in humans, it quickly becomes apparent that no single factor or theory is adequate in isolation to fully understand what makes people happy. The goal of well-being science is to understand and promote well-being through a more holistic systems change approach that encompasses individual and broader domains including families, communities, and society (Herrman & Jané-Llopis, 2005). Most previous research has focused on just one or two contributing factors, instead of considering the contribution of multiple factors drawn from many of life's important domains. Generally, data used to examine well-being has tended to be more economic and health related (and has not included more socio-ecological factors), and regression analyses are typically used to identify important factors in explaining differences in well-being. However, such assessments rarely consider the *relative* importance of the factors. Relative importance refers to the quantification of an individual regressor's contribution to a multiple regression model (Grömping, 2006) and decomposes overall R^2 into each individual predictor's contributions. The variance in the outcome accounted for by the predictors is decomposed, with the relative importance of each predictor in the overall R^2 for each possible ordering of predictors is averaged (Lindeman et al., 1980). Examining relative importance advances the well-being field by enabling researchers to identify what is *most* important. Thus, situated within well-being science, the purpose of this paper is to identify which of a multiplicity of economic, health, and socio-ecological individual and community-based factors are relatively most important in predicting variations in well-being.

What is Well-Being?

Well-Being is an umbrella term that refers to components of individual and collective well-being wherein an individual realizes their own abilities, copes with normal stresses in life, works productively, and contributes to their community (WHO, 2004). Two related, but conceptually distinct, dimensions of well-being are eudaimonic and hedonic well-being. Eudaimonic well-being is a type of happiness that is derived from meaningful purpose in life and becoming a fully functioning person, in that the pursuit of personally valued goals (such as those that make life feel worthy) is a source of well-being (Ryan & Deci, 2001). Hedonic well-being is an approach to happiness that draws on feelings of positive emotions, such as contentment and pleasure (Kahneman & Varey, 1992). Well-Being studies generally focus on life satisfaction, which is also where social policies relevant to well-being have been focused. More recently, there has been a call for policies to also consider eudaimonic well-being such as hope (Graham, 2023) and for governments to measure and monitor eudaimonic well-being in addition to hedonic well-being.

Theoretical Justification for Selection of Predictive Factors

Well-being can be understood as a number of life domains, each holding individual meaning and local importance while embedded within number of institutions in the larger community ecosystem (Atkinson et al., 2020). Satisfaction with community-level institutions (e.g., healthcare, education, government) and conditions (e.g., social cohesion, neighbourhood) predict a significant portion of the variance in well-being (Sirgy & Cornwell, 2001; Sirgy et al., 2008; Sirgy et al., 2000; Sirgy et al., 2010). Identifying contributions to well-being variance at the individual and community level enables researchers to consider the multiple determinants on human functioning. For instance, sense of community can "spill over" into individual's evaluations of their lives wherein a positive impression of one's community is associated with higher well-being. Bottom-up spillover theory

(Andrews & Withey, 1976) is a theoretical model of the relationship between individual life domains and quality of overall life. This theory suggests that quality of life in each individual domain produces spillover effects on overall quality of life. For example, satisfaction with individual life domains (e.g., neighbourhood conditions, relationships) can spill over to produce overall satisfaction (Andrews & Withey, 1976). Bottom-up spill over theory can contextualize how individual-level perception of living conditions (e.g., access and participation; neighbourhood design; resource availability) is an essential component of individual-level well-being within the community. Research has identified places, things, activities, roles, and relationships that in which individuals are typically involved, including leisure, work, consumer, finances, and health (Andrews & Withey, 1976).

In Nova Scotia, survey data on well-being metrics exist at the individual and community level through the Quality of Life Initiative, led by Engage Nova Scotia (ENS; Smale et al., 2020). Based on the community well-being survey created by the Canadian Index of Well-Being (CIW) and guided by its conceptual framework, the survey is designed to be used as a lens for decision-making that is situated within the science of well-being (Michalos et al., 2011). The CIW survey measures indicators in eight life domains: community vitality, democratic engagement, education, environment, healthy populations, leisure and culture, living standards, and time use (Michalos et al., 2011). To assess which individual and community factors are most important when predicting variance in well-being, we incorporated only variables that apply to all individuals (i.e., not variables contingent to answering a certain way to a previous question). For example, a measure of work-life balance would be excluded because participants could only respond to such questions if they were employed, but whether or not they are currently employed (yes/no) would be included. Therefore, by including only variables that all individuals had an opportunity to answer, rather than variables that reflected contingency questions, we ensure the sample reflects the general population without

imposing any restrictions (i.e., the sample was not a subset of the population based on employment, age, or some other characteristic).

Rationale

Uncovering the individual and community factors that shape well-being is relevant to knowledge generation, policy, and practice. Moving beyond traditional regression analysis, though relative importance as a general statistical method has been available for some time (Grömping, 2006), it is rarely applied in the well-being field. To our knowledge, this novel analysis technique has not been used in a regional well-being dataset, or in a dataset arising from such a comprehensive survey that allows for the consideration of many more factors than typically measured. By identifying what factors contribute most strongly to well-being, we may find that some factors are: (a) policy-amenable and can be acted on to improve well-being at a structural level, and (b) relevant to practitioners and can be acted on to improve well-being at an individual level.

Research Questions

The primary purpose of this paper is to explore the relative importance of a multiplicity of individual and community factors for predicting variance in well-being. Our research questions are:

1) Do community factors or individual factors appear to be more important in predicting well-being?
2) Do the most relatively important community and individual factors differ when predicting hedonic well-being compared to predicting eudaimonic well-being?

Method

Source of Data

Data were drawn from a province-wide survey administered in the spring and summer of 2019 by the CIW. Conducted in partnership with ENS, a not-for-profit organization committed to

having well-being recognized as a measure of success and progress, the survey was completed by almost 13,000 residents (N = 12,826).

Sampling Procedure

Based on mailing addresses held by Canada Post, the survey population was created by selecting a stratified random sample of approximately 80,000 residential households in Nova Scotia drawn proportionately from across ten functional economic regions in the province (Smale et al., 2020). An oversampling of rural regions in the province was conducted to ensure adequate representation from these less densely populated areas. Potential participants were sent a letter inviting a household member 16 years of age or older whose birthday came closest to June 1 to participate in an online survey. Participants were provided with a link to the online survey and accessed it using a unique 5-digit code during the three month collection period from April to June 2019. In addition to the randomly selected households, there was targeted outreach to specific groups who might not typically participate in traditional survey approaches (e.g., lower income residents; people living with disabilities; older adults; Smale et al., 2020).

A total of 12,826 residents provided complete, valid, and usable surveys, which represents an estimated 16% response rate. Most surveys were completed online (n = 11,363; 87%) with the remainder completed on paper on request or by targeted outreach groups. Given the size of the sample, the margin of error when reporting descriptive statistics for Nova Scotia is estimated to be within ±1.0%; and is somewhat higher for each of the 10 regions across the province (Smale et al., 2020).

Survey Instrument

The questionnaire was comprised of three major sections. The first major section included questions organized around the eight domains of life represented in the CIW's conceptual

framework: community vitality, democratic engagement, education, the environment, healthy populations, leisure and culture, living standards, and time use (CIW, 2016). For example, questions within the community vitality subsection focused on aspects such as volunteering and social connectedness, while questions within the living standards sub-section focused on aspects related to employment and financial security. The second major section gathered participants' perceptions of their overall well-being, including measures of hedonic and eudaimonic well-being. Finally, the third major section collected information on an array of demographic characteristics including sex at birth, age, income, education, place of birth, and disability status.

Data Weighting

To ensure the descriptive statistics from the survey are representative of the residents of Nova Scotia, the data provided by the 12,826 respondents were weighted by sex, age, and region to correspond with the Census profile estimated for 2019 for those residents 16 years of age and older (N = 787,120). Drawing on the 2016 Census of Canada, population estimates for 2019 were calculated using growth rates within each region. These estimates were then used to weight proportionately the distributions of respondents to the survey to be better represent distributions of residents in each region and across the entire province. It should be noted, however, that population weights are incorporated only for the descriptive statistics summarized in Figure 2.1. Inferential statistics were based on the unweighted data to avoid biased estimates; rather, age and sex were incorporated as control variables in the models.[1]

[1] Early drafts of our analyses also incorporated region as a random effect. However, region-level variance was incredibly small for life satisfaction and life worthwhileness, respectively (ICCs < .005). That is, region predicted virtually none of the variation in our outcomes. Thus, for model parsimony and to allow for a more straightforward calculation of effect sizes, we omitted region from the final models presented.

Selected Measures

The selected variables represent all eight domains in the CIW conceptual framework to ensure a multiplicity of factors, typically absent from previous research, were included in the analyses.

Well-Being Measures

Well-being was measured with two single-item measures: life satisfaction (i.e., hedonic or evaluative well-being) and life worth (i.e., eudaimonic well-being). The 10-point life satisfaction measure asks, "How satisfied are you with your life in general?" and provides two anchor labels (1 = very dissatisfied, 10 = very satisfied). The 10-point life worth measure asks, "To what extent you feel the things you do in your life are worthwhile?" and provides two anchor labels (1 = not at all, 10 = completely).

Community Vitality

Perceived Neighbourhood Safety. Perceptions of being safe from crime in one's neighbourhood after dark was measured on a 7-point scale (1 = very unsafe, 7 = very safe) in response to the question, "How safe from crime do you feel walking alone after dark in your neighbourhood?"

Membership to a Faith-Based Group. Belonging to a faith-based group was measured on a dichotomized scale (0 = No, 1 = Yes) in response to the question, "In the past 12 months, were you a member of, or a participant in, a faith-based group?"

Volunteer Status. Volunteer status was measured on a dichotomized scale (0 = No, 1 = Yes) in response to the question, "In the past 12 months, did you do any unpaid volunteer work for any organization?"

Number of Close Relationships. Three variables related to social support were selected for inclusion in the analysis. number of close relatives ("How many relatives (including uncles, aunts,

cousins) do you have who you feel close to, that is, who you can feel at ease with, can talk to about what is on your mind, or call on for help?"), number of close friends ("How many friends do you have, that is, people who are not your relatives, but who you feel at ease with, to talk about what is on your mind, or call on for help?"), and number of neighbours close enough to ask a favour ("How many people in your neighbourhood do you know well enough to ask for a favour?"). An upper limit of 100 was applied to these social support variables to maintain data integrity.[2]

Sense of Community Scale. A previously validated 12-item Sense of Community scale (Prezza et al., 2009) was adopted for this study. Participants' responses to the items comprising this scale were measured on a 7-point Likert scale from 1 (Very strongly disagree) to 7 (Very strongly agree) and then averaged. A sample items is, "I feel at ease with the people in my community." See the online supplementary materials for a summary of a confirmatory factor analysis demonstrating a unidimensional factor structure and a list of all items. For the current sample, the scale has good internal consistency ($\alpha = .88$), which is identical to the reliability of the scale originally reported ($\alpha = .88$; Prezza et al., 2009).

Healthy Populations

Self-Assessed Health. Both self-rated physical health and self-rated mental health were measured on a 5-point scale (1 = poor, 5 = excellent) in response to the questions, "In general, how would you say your physical health is?" and "In general, how would you say your mental health is?"

Physical Exercise. Frequency of physical exercise was measured on a 7-point Likert scale (1 = very strongly disagree, 7 = very strongly agree) in response to the statement, "In the past week, I engaged in good quality exercise."

[2] An arbitrary upper limit of 100 was imposed on the three items measuring number of relatives, friends, and neighbours, as values higher than this are both implausible and extreme multivariate outliers. In each instance, less than 0.5% of the sample reported more than 100 persons.

Time Use

Time Adequacy. A slightly modified version of the Time Adequacy scale (Moen et al., 2008) was used to determine if time devoted to certain activities was adequate (e.g., "To participate in or be active in your community"). Twelve items were measured on a 10-point scale ranging from 1 (Not at all enough) to 10 (Almost always enough). A composite score was created by calculating the average of all 12 items. See the online supplementary materials for a summary of a confirmatory factor analysis demonstrating a unidimensional factor structure and a list of all items. The original Time Adequacy scale (Moen et al., 2008) had good internal consistency ($\alpha = 0.89$) and internal consistency was excellent in the present dataset ($\alpha = .97$).

Democratic Engagement

Perceived Benefit From Public Policy. Perceived benefit from public policy was measured on a 7-point scale (1 = much worse off, 7 = much better off) in response to the question, "Have the programs and services of the local government (municipal, band, and/or regional) made you better off?"

Environment

Satisfaction with Quality of Natural Environment. Participants' satisfaction with quality of natural environment was measured on a 7-point Likert-type scale (1 = very dissatisfied, 7 = very satisfied) in response to the question, "How satisfied are you with the quality of the natural environment in the neighbourhood in which you live?"

Living Standards

Financial Insecurity Scale. A measure of financial insecurity was created by combining participants' responses to eight items indicating how frequently their financial security was threatened in the past year (e.g., "I could not pay my bills on time"). Items were measured using a 5-point scale ranging from 1 (Never) to 5 (At least once a month) and the composite measure was created by calculating an average score with higher scores reflecting greater financial insecurity. A confirmatory factor analysis indicated that these items could be combined into a value reflecting a one-factor financial insecurity score with good internal consistency ($\alpha = .88$).

Demographic Variables

Ten demographic variables were included in the analysis. *Age* was measured as a continuous variable, in years. *Annual household income* was measured using ten groupings ranging from less than $10,000 to $150,000 and higher. *Highest education level completed* was measured using six groupings starting with elementary school and ending with graduate degree. *Proportion of lifetime spent in Canada* was calculated as age divided by years spent in Canada. Other demographic variables included were dichotomous and measured as binary variables: sex at birth (i.e., male = 0 or female = 1), *immigrant status* (i.e., whether the participant was born in Canada =1 or not =0), *employment status*, (i.e., works for pay =1 or not = 0), *parental status* (i.e., having at least one child = 1 or not = 0), *relationship status* (i.e., having a partner = 1 or not =0), and *disability status* (i.e., living with a disability or chronic condition = 1 or not = 0).

Data Analysis Plan

Data were analyzed using R (version 4.0.5). Multiple linear regression was used to predict life satisfaction and life worthwhileness in separate models. For effect sizes, we relied on semi-partial squared correlations (sp^2) and measures of relative importance using the Lindeman, Merenda and

Gold (lmg) method in Grömping's (2006) *relaimpo* package in R. Semi-partial correlations represent the proportion of unique variance in the outcome accounted for by each predictor. Relative importance is a decomposition of the total R^2 for each variable such that coefficients sum to R^2; in other words, relative importance is the proportion of the total R^2 contributed by each predictor. We also re-analyzed each model using robust regression as a sensitivity test (Field & Wilcox, 2017). Field and Wilcox (2007) suggest using robust statistics as a sensitivity check for violated assumptions in place of traditional assumption checking for normality and outliers. In short, if the results of a robust analysis do not differ much from a non-robust analysis, this indicates that non-normal residuals and multivariate outliers did not have undue impact on the results. Robust regression methods sacrifice clear standardized effect sizes for robustness against violated assumptions (e.g., normality).

Results

Profile of Sample

The final sample was 53% female, most born in Canada (84.1%), and with a median annual household income of $60,000 to $80,000 (see Table 1). Values in Table 2.1 adapted with permission from Tables 1-J10 of the first survey report from Engage (Smale et al., 2020).

Preliminary Data Analysis

Bivariate correlations are presented in Figure 2.1. Both dimensions of well-being (i.e., life satisfaction and life worth) were significantly associated with all variables except for the proportion of lifetime spent in Canada and sex at birth. Associations with well-being varied by predictor (value of *r* ranged from -.03 to .54). The only negative association with life satisfaction was financial insecurity. In general, the predictor variables were moderately correlated with each other as one

would expect, but none of the correlations were strong enough to raise concerns over multicollinearity (i.e., had simple bivariate correlations less than 0.70) and therefore each factor made relatively unique contributions in explaining variations in well-being.

Primary Data Analysis. Regression Models

Model 1. Multiple Regression Predicting Life Satisfaction

Our first regression model was built to predict life satisfaction based on 22 independent variables (Table 2.2). We used relative importance (ri) to identify which variables predicted the most variance in life satisfaction. Collectively, the 22 variables predicted more than half of the variance in life satisfaction (R^2 = .51), mainly due to the relative importance of six variables (R^2 = .39): self-rated mental health (ri = .11), time adequacy (ri = .08), satisfaction with natural environment (ri = .07), sense of community (ri = .05), financial insecurity (ri = .05), and self-rated physical health (ri = .03).

Model 2. Multiple Regression Predicting Life Worth

Our second regression model was built to predict life worth from the same 22 independent variables as above (Table 2.3). Collectively, the 22 variables predicted just over 40% of the variance in life satisfaction (R^2 = .42), mainly due to the relative importance of five variables (R^2 = .31), four of which were the same as in Model 1: self-rated mental health (ri = .10), satisfaction with natural environment (ri = .07), time adequacy (ri = .06), sense of community (ri = .05), and financial insecurity (ri = .03).

A comparison of relative importance between the two models predicting variance in well-being is presented in Table 2.4, showing that both measures of well-being share the same top predictors.[3] Of note, these predictors accounted for less variance in life worth (i.e., eudaimonic well-

[3] When age^2 was removed from the model, the linear coefficients for age when predicting life satisfaction were B = .00, β = -.03, 95% CI for β [-.05, -.01] and the linear coefficients when predicting life worth were B = -0.01, β = -.04, 95% CI for β [-.06, -.02] No other slopes changed in any substantial way.

being) than in life satisfaction (i.e., hedonic or evaluative well-being). Our robust regression analysis showed similar results (see Tables S1 and S2; https://static-content.springer.com/esm/art%3A10.1007%2Fs42413-023-00196-8/MediaObjects/42413_2023_196_MOESM1_ESM.docx). Both models showed nearly identical significant predictors with consistent unstandardized coefficients. For example, when predicting life satisfaction, the unstandardized coefficients differed by only .014 on average (minimum = .00, maximum = .1). When assessing null hypothesis testing conclusions with *p*-values, the robust model had three more statistically significant predictors (feelings of safety walking alone after dark in the neighbourhood; self-rated physical health). Proportion of lifetime spent in Canada and participation in volunteering significantly predicted life worth in the non-robust model, but not the robust model. The robust model showed feelings of safety walking alone after dark in neighbourhood as a significant predictor of life worth, which the non-robust model did not. Otherwise, the pattern of results was very similar when compared to the traditional multiple regression analysis, suggesting our results are not affected much by violated statistical assumptions. However, when null hypothesis test conclusions differ, readers should probably place more weight on the robust analysis (Field & Wilcox, 2017). Importantly, the top six predictors seem generally robust to this sensitivity test.

Discussion

The purpose of this paper was to explore the *relative importance* of community and individual factors that explain variations in well-being. We were granted the opportunity to assess predictors of well-being in a largely unexplored dataset that is unique in size and scope, representative of a major Canadian province, and grounded in well-being science framework. Given the large sample and number of potential predictors in the dataset, identifying the relative importance of each predictor is more informative than relying on traditional null hypothesis significance testing. We analyzed the

relative importance of numerous predictor variables to predict as much variance in well-being as possible.

We accounted for about half of the variance in life satisfaction. In particular, the top six predictors accounted for most of the variance, suggesting that both community-level (i.e., environment quality of neighbourhood, sense of community) and individual-level (i.e., mental health, time adequacy, financial insecurity, and physical health) variables are substantial predictors of well-being. Both life satisfaction and life worth shared the same top six predictors, although the effect sizes were smaller for life worth, suggesting there may be important predictors of eudaimonic well-being not accounted for in these analyses.

Relatively Important Predictors of Variation in Well-Being

In the following section, we discuss the top six predictors of variation in well-being in order of their relative importance.

Mental Health

Self-rated mental health was the strongest predictor of variance in both life satisfaction and life worth, relative to the entire set of independent variables. Well-Being and mental health are separate but related constructs (Cloninger, 2006) in that well-being refers to an overall sense of how life is going which is subject to daily fluctuations (Waterman, 2007) and mental health reflects a spectrum of functioning that shapes one's ability to handle stress, make decisions, and cope with the ups and downs of daily life (Orpana et al., 2016). Mental health and well-being may bidirectionally influence one another; maintaining positive mental health may lead to a sense of well-being (such as being satisfied with one's life), and vice versa, enjoying a sense of well-being may be a protective factor against poor mental health.

Neighbourhood Environment Quality

Feeling satisfied with the quality of the environment in which you live has been linked to mental health and well-being (Leslie & Cerin, 2008), where positive perceptions of the neighbourhood promote mental health. For instance, spending time outdoors was identified as a protective factor against poor well-being outcomes during the COVID-19 pandemic (Bu et al., 2020). A relatively new theory, eco-existential positive psychology, holds that engaging with the natural environment addresses existential anxieties, such as happiness, isolation, freedom, and death (Passmore & Howell, 2014), all of which may be heightened during a global pandemic. Indeed, this theory is particularly applicable to eudaimonic well-being; the relationship between natured connectedness and various components of eudaimonic well-being (e.g., social well-being, personal growth, meaning in life, engagement) have been documented in the literature (Herzog & Strevey, 2008; Howell et al., 2011; Howell et al., 2013; Nisbet et al., 2011; Peterson et al., 2007).

Time Adequacy

Time use shapes well-being in a variety of ways, such as time adequacy and having the autonomy to choose how to spend it (Bhattacharjee & Mogilner, 2014; Mogilner et al., 2018; Mogilner & Norton, 2016). Moreover, the relationship between time-use and well-being may be bidirectional, as mental ill-health has been linked to decreased physical exercise (Fancourt et al., 2020), less motivation to spend time on leisure activities (Fancourt et al., 2020), and increased engagement in passive screen time (Gunnell et al., 2016), all of which hinder well-being.

Sense of Community

Sense of community (SOC) is considered a basic human need (Maslow, 1954) for quality of life. Early research identified feelings of belonging to a community as a determinant of psychological well-being (Hagerty & Patusky, 1995) and social functioning (Hagerty et al., 1996). In Canada, higher

SOC is associated with self-assessed health, even after controlling for proxies of socio-economic status, chronic illness, health behaviours, and stress (Ross, 2002), and low SOC is associated with poor mental health (Michalski et al., 2020). The underlying mechanisms between SOC and well-being may be that positive social climate and tight bonds, the sense of having needs fulfilled in one's community, or having help available in case of need (McMillan & Chavis, 1986) all lead to an increase in well-being.

Physical Health

Self-reported physical health has been identified as one of the largest contributors to the indirect effects of lifestyle choices on mental health (Ohrnberger et al., 2017). Potentially, those with positive perceptions of their physical health enter a cycle of engaging in health-promoting behaviours (e.g., physical exercise) and making healthy lifestyle choices (e.g., abstaining from cigarettes) which in turn lead to a higher sense of well-being. A recent study reported that engaging in a range of health-promoting behaviours such as consuming nutritious food, practicing good sleep hygiene habits, and physical activity are all predictive of well-being (Smith et al., 2022), suggesting that healthy lifestyle choices may be a mental health promotion tool.

Financial Security

While financial security can contribute to well-being, the association between income and well-being is strongest at lower income levels and then declines as income increases (Biswas-Diener & Diener, 2001; Howell & Howell, 2008), suggesting that basic financial security is strong predictor of well-being. Financial security may make it easier to meet basic needs such as a sense of security and autonomy. Weinstein and Stone (2018) showed that experiencing financial insecurity can thwart basic psychological needs and lower well-being across income levels. In sum, financial security is

linked to well-being by not only being able to meet basic needs, but also by providing a sense of resilience via security and autonomy.

In sum, our results suggest that mental health, quality of the natural environment in neighbourhoods, feelings of time adequacy and sense of community, positive perceptions of physical health, and being financially secure are key drivers of overall well-being. These individual factors are particularly important for life satisfaction as it may be that achieving well-being in a hedonic sense (i.e., enjoying comfort and pleasure) is achievable through these factors. Though they are still the strongest predictors, the overall effect sizes for life worth were smaller, suggesting there are other experiences, life circumstances, and living conditions that promote feelings of life worth beyond the six factors identified here. Eudaimonic well-being, as measured by life worth, may be more strongly associated with factors not included in this dataset, such as goal attainment or feeling a calling in one's work. That is, while life satisfaction and life worth are highly correlated, they are conceptually distinct constructs. The difference in effect sizes illustrate how life satisfaction can be predicted by factors typically measured in well-being surveys, whereas life worth may be more of a specific, internal assessment related to life goals and purpose. The factors that predict well-being in general are similarly important for both life satisfaction and life worth, but not necessarily to the same degree for everyone.

Limitations and Future Directions

While relative importance analysis is a valuable tool for quantification of an individual regressor's contribution to a multiple regression model (Grömping, 2006), it has limitations. In general, relative importance analysis will work better than traditional regression weights in terms of correctly partitioning variance in the presence of large correlations among the independent variables (i.e., collinearity; Tonidandel & LeBreton, 2011). However, like any cross-sectional multiple regression model, in specifying a single outcome variable, the model fails to account for potentially

complex interactions, indirect effects, and causal relationships among the predictors. Thus, we can describe which variables predict the most variance in well-being but cannot learn much about the mechanisms behind such correlations. If intercorrelations among predictors are due to construct overlap (rather than causal relationships), such intercorrelations may artificially minimize the overall importance of a particular variable because the overall importance of that variable will be partitioned by the redundant predictors (Stalder et al., 2017).

Research rooted in well-being science is emerging, particularly as the global pandemic shifts conversations toward what matters most for quality of life. Periodic surveying and monitoring of well-being in representative samples will help keep the evidence base accurate and up to date, inform more specific research avenues in well-being, and build on baseline knowledge of pre-pandemic well-being knowledge. In particular, inclusive surveying that offers participants the opportunity to report their own demographic characteristics (e.g., sexual orientation, gender identity) rather than choose from a pre-defined list of categories would be important to capturing diversity in data. Given the limitations of multiple regression, future research might analyze data using network analysis (Boorsboom & Cramer, 2013) which would allow for a more nuanced examination of the interrelationships between predictors. As part of our variable selection process, we chose variables that were theoretically linked to well-being and non-contingent on any other variable. This means we might have missed some factors that are important to well-being (not to mention policy-amenable or practice-relevant) such as work-life balance, perception of time spent with one's children, and time spent participating in unpaid labour. Finally, building on these findings to uncover which individual and community factors are associated with eudaimonic well-being (e.g., life worth) more than hedonic well-being (e.g., life satisfaction) would paint a more holistic picture of well-being than what this study currently can.

Implications

Factors that contribute to well-being include mental health promotion, perceptions of time adequacy, satisfaction with one's neighbourhood environment, sense of community, and financial security. Notably, some factors are more policy-amenable than others. For example, efforts to improve well-being by attending to social determinants of mental health could include strengthening work-life balance conditions at the organizational level (time adequacy) or developing social connection programs at the community level (sense of community). These findings can inform programming and policy that seeks to promote well-being for individuals and their communities. Implementing public policy that favours mental health (Kobau et al., 2011) through whole of government and whole of society approaches (Barry, 2019) is needed. As well-being is shaped by every policy at each socio-ecological level (e.g., minimum wage amounts and vacation time at work; universal basic income at the societal level), advocating for policies that support mental health, enable families to have time to enjoy life, and improve social connections within communities is important. Program planning and implementation could take these findings into account, and design programs that bring individuals together in the community. Canada's strategy for quality of life has contributed to a national dialogue suggesting that future investments could be guided by monitoring progress on quality-of-life indicators (Department of Finance Canada, 2021), many of which are identified in this analysis as being "relatively most important" when such decisions are made.

Conclusion

This study utilized a novel method to assess the relative importance of individual and community factors in predicting variance in two dimensions of well-being. We learned that both community-level (i.e., environment quality of neighbourhood, sense of community) and individual-level (i.e., mental health, time adequacy, financial insecurity, and physical health) variables are

substantial predictors of well-being, which may inform community-level programming and policy that seeks to promote well-being for individuals and their communities. Moving beyond just identifying predictors of well-being, this paper investigates what is most important to well-being, which provides new insights into the multi-level determinants of well-being, at the individual and community level in a large, representative sample. We believe this paper makes a valuable contribution toward understanding what matters most for well-being. This study provides evidence for which factors can be focused on to improve well-being. In conclusion, focusing on improving mental health, perceptions of time adequacy, satisfaction with one's neighbourhood environment, sense of community, and financial security may help improve well-being overall.

Table 2.1

Descriptive Statistics

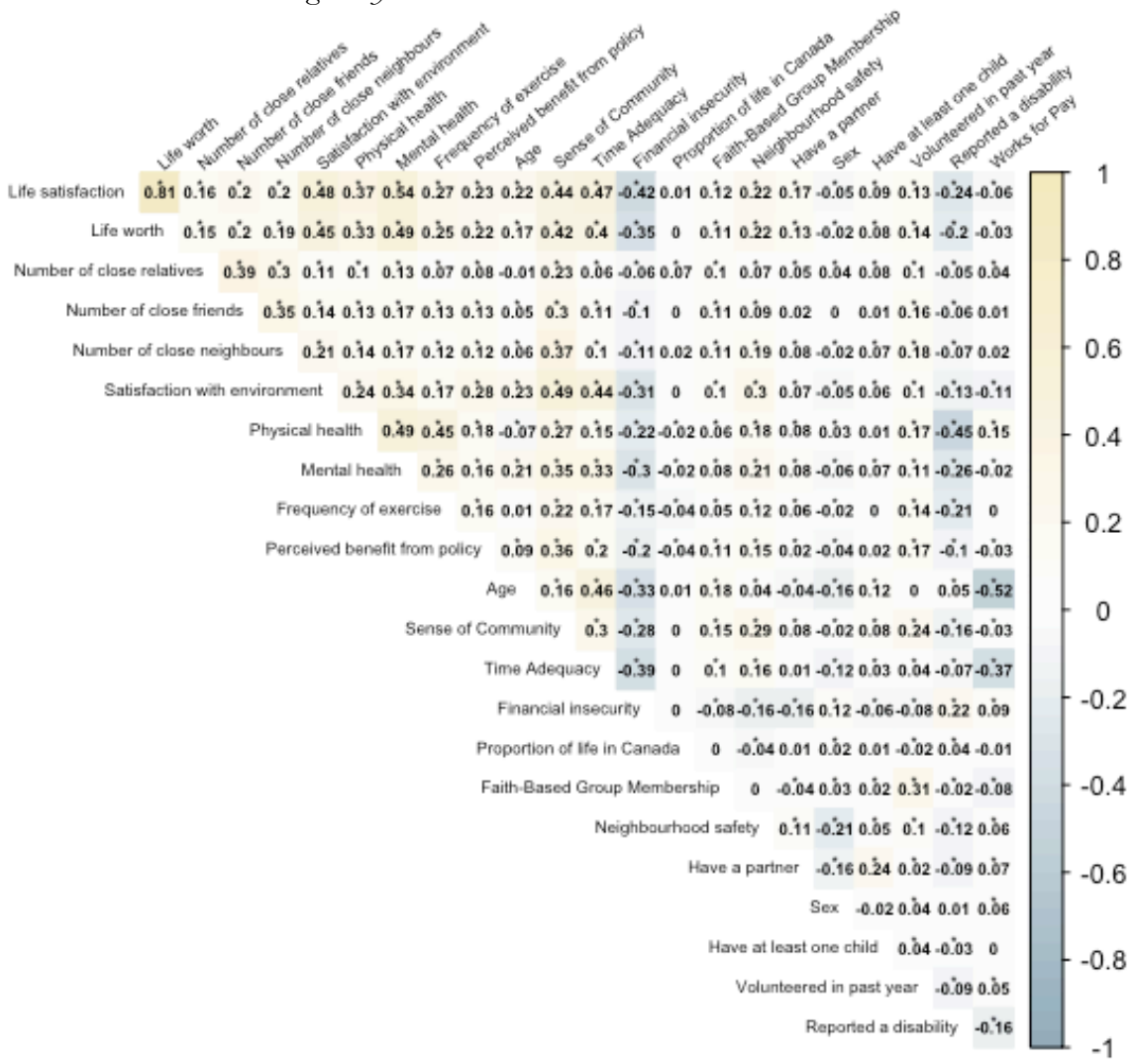
Domain Variable	*M*	*SD*	%
Demographics			
Age	50.30	17.35	
Works for pay			62.1
Has children			66.6
Highest education level			
Elementary school			3.0
High school			20.1
Trade/apprentice college			19.9
College diploma			17.1
University degree			26.3
Graduate degree			13.6
Proportion of life spent in Canada			96.6
Born in Canada			92.4
Has a partner			93.1
Sex at birth			
Female			52.1
Male			47.9
Reports a disability and/or chronic illness			26.0
Annual Household Income			
Less than $10,000			5.2
$10,000 - $19,999			4.3
$20,000 - $29,999			7.5
$30,000 - $39,999			7.9
$40,000 - $59,999			15.7
$60,000 - $79,999			14.6
$80,000 - $99,999			12.5
$100,000 - $119,999			10.5
$120,000 - $149,999			9.7
$150,000 and higher			12.0
Community Vitality			
Number of close relatives	5.84	5.64	
Number of close friends	4.86	4.56	
Number of neighbours known well enough to ask a favour	4.17	4.60	
Overall Sense of Community scale	4.71	0.89	
Feeling of safety alone in neighbourhood at dark	5.63	1.50	
Volunteered in past 12 months			52.1
Member of a faith-based group			20.4
Healthy Populations			
Self-rated physical health	3.33	0.97	
Frequency of physical exercise	4.67	1.60	

Self-rated mental health	3.41	1.00
Time Use		
Time Adequacy scale	7.00	2.40
Democratic Engagement		
Perception of benefiting from government policy	4.42	1.22
Environment		
Satisfaction with quality of natural environment	5.29	1.41
Living Standards		
Financial insecurity	1.42	0.79
Well-Being		
Life satisfaction	7.68	2.15
Life worth	7.73	2.03

Note. Descriptive statistics are presented with population weighting applied, meaning that proportions are presented as percentages without frequency counts. These values have been adapted with permission from Tables 1-J10 of the first survey report from Engage (Smale et al., 2020).

Figure 2.1

Bivariate Correlations Among Study Variables



Note. Yellow represents positive correlations; blue represents negative correlates. * p <0.05.

Table 2.2

Multiple Regression Model Predicting Life Satisfaction (Hedonic Happiness)

Coefficient	B	*β*	*95 CI B*	*95 CI β*	*p*	*sR²*	*Relative importance*
Intercept	1.69	0.00	1.20 – 2.18	-0.01 – 0.01	**<0.001**	**--**	**--**
Mental Health	0.63	0.29	0.59 – 0.67	0.27 – 0.30	**<0.001**	.051	0.114
Time Adequacy	0.21	0.24	0.19 – 0.23	0.22 – 0.26	**<0.001**	.032	0.083
Environment Satisfaction	0.26	0.16	0.24 – 0.29	0.15 – 0.18	**<0.001**	.017	0.072
Sense of Community	0.26	0.11	0.22 – 0.31	0.09 – 0.13	**<0.001**	.007	0.053
Financial Security	-0.33	-0.13	-0.38 – -0.29	-0.15 – -0.11	**<0.001**	.015	0.050
Physical Health	0.06	0.03	0.02 – 0.10	0.01 – 0.05	**0.007**	.000	0.032
Physical Exercise	0.07	0.06	0.05 – 0.09	0.04 – 0.07	**<0.001**	.003	0.018
Has a Partner	0.50	0.10	0.43 – 0.58	0.09 – 0.12	**<0.001**	.011	0.014
Disability Status	-0.16	-0.03	-0.23 – -0.08	-0.05 – -0.02	**<0.001**	.001	0.013
Benefit from Policy	0.01	0.01	-0.02 – 0.04	-0.01 – 0.02	0.414	.006	0.009
Neighbourhood Safety	-0.00	-0.00	-0.02 – 0.02	-0.02 – 0.02	0.917	.005	0.009
Age	-0.04	-0.26	-0.05 – -0.03	-0.35 – -0.17	**<0.001**	.002	0.008
Age Squared	0.00	0.24	0.00 – 0.00	0.15 – 0.33	**<0.001**	.001	0.008
Friends	0.01	0.03	0.00 – 0.02	0.01 – 0.05	**<0.001**	.001	0.006
Neighbours	-0.00	-0.01	-0.01 – 0.00	-0.03 – 0.01	0.300	.000	0.005
Relatives	0.01	0.02	0.00 – 0.01	0.00 – 0.04	**0.016**	.000	0.004
Volunteer Status	0.06	0.01	-0.01 – 0.12	-0.00 – 0.03	0.088	.001	0.003
Has Kids	0.13	0.03	0.06 – 0.20	0.01 – 0.04	**<0.001**	.001	0.003
Work for Pay	0.20	0.05	0.13 – 0.28	0.03 – 0.07	**<0.001**	.000	0.003
Faith-Based Group Membership	0.07	0.01	-0.00 – 0.14	-0.00 – 0.03	0.061	.000	0.002
Time in Canada	0.46	0.03	0.22 – 0.70	0.01 – 0.04	**<0.001**	.000	0.001
Sex at birth	-0.13	-0.03	-0.19 – -0.07	-0.05 – -0.02	**<0.001**	.000	0.001
R^2							.51

Note. B = unstandardized coefficient. β = standardized coefficient. In 95 confidence intervals for *B:* sR^2 = semi-partial R-squared. Predictor variables are presented in order of relative importance (largest to smallest).

Table 2.3

Multiple Regression Model Predicting Life Worth (Eudaimonic Well-Being)

Coefficient	B	*β*	*95 CI B*	*95 CI β*	*p*	*sR²*	*Relative importance*
Intercept	2.14	-0.00	1.63 – 2.64	-0.02 – 0.02	**<0.001**		
Mental Health	0.55	0.27	0.51 – 0.59	0.25 – 0.29	**<0.001**	.045	0.096
Environment Satisfaction	0.27	0.18	0.24 – 0.30	0.16 – 0.20	**<0.001**	.020	0.071
Time Adequacy	0.15	0.19	0.14 – 0.17	0.17 – 0.21	**<0.001**	.019	0.057
Sense of Community	0.27	0.13	0.23 – 0.32	0.10 – 0.15	**<0.001**	.009	0.052
Financial Security	-0.22	-0.09	-0.27 – -0.18	-0.11 – -0.07	**<0.001**	.007	0.032
Physical Health	0.02	0.01	-0.02 – 0.06	-0.01 – 0.03	0.337	.000	0.025
Physical Exercise	0.07	0.06	0.05 – 0.09	0.04 – 0.07	**<0.001**	.002	0.015
Has a Partner	0.35	0.08	0.28 – 0.43	0.06 – 0.09	**<0.001**	.007	0.009
Neighbourhood Safety	0.02	0.01	-0.01 – 0.04	-0.01 – 0.03	0.189	.000	0.009
Benefit from Policy	0.01	0.00	-0.02 – 0.03	-0.01 – 0.02	0.676	.002	0.008
Disability Status	-0.06	-0.02	-0.14 – 0.01	-0.03 – 0.00	0.097	.000	0.008
Friends	0.01	0.03	0.00 – 0.02	0.01 – 0.05	**<0.001**	.001	0.006
Neighbours	-0.01	-0.01	-0.01 – 0.00	-0.03 – 0.00	0.109	.000	0.005
Age	-0.02	-0.18	-0.04 – -0.01	-0.27 – -0.08	**<0.001**	.001	0.005
Age Squared	0.00	0.15	0.00 – 0.00	0.05 – 0.24	**0.004**	.001	0.005
Volunteer Status	0.12	0.03	0.05 – 0.19	0.01 – 0.05	**<0.001**	.001	0.005
Relatives	0.00	0.02	0.00 – 0.01	0.00 – 0.03	**0.047**	.000	0.003
Work for Pay	0.23	0.06	0.15 – 0.30	0.04 – 0.08	**<0.001**	.002	0.002
Has Kids	0.10	0.02	0.02 – 0.17	0.01 – 0.04	**0.009**	.000	0.002
Faith-Based Group Membership	0.05	0.01	-0.03 – 0.12	-0.01 – 0.03	0.207	.004	0.001
Sex at birth	-0.19	-0.05	-0.25 – -0.13	-0.07 – -0.03	**<0.001**	.001	0.001
Time in Canada	0.29	0.02	0.04 – 0.53	0.00 – 0.03	**0.021**	.001	0.000
R^2							.42

Note. B = unstandardized coefficient. *β* = standardized coefficient. In 95 confidence intervals for *B.* sR^2 = semi-partial R-squared. Predictor variables are presented in order of relative importance (largest to smallest).

Table 2.4

Comparison of Relative Importance of Independent Variables Predicting Variance in Life Satisfaction and Worth

Variable	Life satisfaction	Life worth
Self-rated mental health	0.114	0.096
Time Adequacy	0.083	0.057
Satisfaction with natural environment in neighbourhood	0.072	0.071
Sense of Community	0.053	0.052
Financial insecurity	0.050	0.032
Self-rated physical health	0.032	0.025
Frequency of exercise	0.018	0.015
Have a partner	0.014	0.009
Reports a disability and/or chronic condition	0.013	0.008
Perception of benefiting from government policy	0.009	0.008
Feelings of safety in neighbourhood after dark	0.009	0.009
Age	0.008	0.005
Age^2	0.008	0.005
Number of close friends	0.006	0.006
Number of close neighbours	0.005	0.005
Number of close relatives	0.004	0.003
Volunteered in past 12 months	0.003	0.005
Works for pay	0.003	0.002
Has at least one child	0.003	0.002
Faith-based group membership	0.002	0.001
Sex at birth	0.001	0.001
Proportion of life spent in Canada	0.001	0.000
R^2	.51	.42

Note. Variables are presented in order of size of relative importance value for life satisfaction.

Chapter 3

From Universal Well-Being Factors to Identifying Personality-Driven Processes

In Chapter 2, I showed that both community-level and individual-level variables are substantial predictors of well-being. These findings can inform community-level programming and policy through mobilizing knowledge on what matters most for well-being to community organizations. For example, community organizations such as the YMCA have used these data to make decisions on the design and delivery of programs that aim to increase well-being among community residents. The single-item measures of eudaimonic and hedonic well-being were highly correlated ($r = .81$), but were not equally well-predicted by variables in the model. The difference in effect sizes (e.g., $R^2 = .51$ for life satisfaction vs. $R^2 = .42$ for life worth) illustrate how there are conceptual differences in the two dimensions of well-being, which may explain why life satisfaction is more strongly predicted by factors typically measured in well-being surveys (whereas life worth may be a more specific, internal assessment related to life goals and purpose). The factors that predicted well-being in general were similarly important for both life satisfaction and life worth, but not necessarily to the same degree for everyone. This may also be due to my variable selection process; I might have missed some factors that are uniquely important to eudaimonic well-being, such as feeling competent at personally-valued activities or connected to close others.

Calculating relative importance effect sizes is a more sophisticated and informative statistical technique than traditional regression weights, in terms of correctly partitioning variance in the presence of large correlations among the independent variables (which is common in large surveys such as the one used in Chapter 2). However, by definition, a cross-sectional multiple regression model specifies a single outcome variable, and cannot account for potentially complex interactions, indirect effects, and causal relationships among the predictors. While I can describe which variables

predict the most variance in eudaimonic and hedonic well-being, this approach is unable to test the mechanisms behind correlations. To build on these findings, identifying factors that are more strongly associated with eudaimonic well-being would paint a fuller picture. Overall, by showing that top drivers of well-being are feeling one has adequate time and resources to nurture their lifestyle and a strong sense of community, I highlighted the role of the basic psychological need concepts of autonomy and relatedness (Deci & Ryan, 2001) in well-being.

A major application of well-being research is to inform interventions that aim to increase levels of happiness through engagement in certain activities (Lyubomirsky et al., 2005). Much of the research on positive psychology interventions have been on experimentally introducing new behaviours and testing whether theoretical premises hold. Another way to gain insight into the things people do is to ask them open-ended questions about their core life projects. The positive psychology literature has been focused on short-term activities, indicating that exploring more long-term activities can extend the literature. Personal projects are temporally extended, personally salient, action-oriented, and contextual; thus, they provide an interesting avenue to apply the premises of the Sustainable Happiness Model, which have traditionally focused on instructing the enactment of new behaviours rather than applying these models to pre-existing behavioral repertoire. Activities at the daily level (e.g., positive simple activities) to grand life pursuits (e.g., feeling one has a life calling), can satisfy basic psychological needs (Reis et al., 2000). Perhaps most relevant to need satisfaction, is the mid-range of daily life. Here, using personal projects as the unit of analysis is broader than daily activities but more easily measured than grand life pursuits. As my overall goal is to understand how high achieving people experience well-being (both feel good and function well) through engaging in everyday activities embedded in their goals, the next chapter describes a study that is personality-centered. I propose that, when activities are well suited to one's personality strengths, the associated boost in well-being can be explained by need satisfaction. In other words, high achieving people

tend to engage in productive activities embedded in the pursual of their goals (Judge & Ilies, 2002) which makes them feel competent. In the next chapter, I describe a study aimed at identifying the relationships between achievement-related personality traits, basic psychological need satisfaction, need-relevant activities, and well-being.

Chapter 4

Crafting Happiness from Everyday Life: Personality, Personal Projects, Basic Psychological Need Satisfaction, and Well-Being

Taylor Hill developed the research questions, was directly involved in the primary data collection for this study, and acquired an ethics review at Dalhousie University. She and her dissertation supervisor (Dr Sean P. Mackinnon) co-supervised an undergraduate honours thesis student (Emma C. Coughlan) who supported the literature review for this manuscript. Taylor completed all statistical analyses and writing of the first draft of this manuscript. She received feedback on the study design, analytic approach, and editorial comments from the study's senior co-author (i.e., Taylor's dissertation supervisor, Dr Sean P. Mackinnon) as well as research assistance in checking R code for accuracy from a paid research assistant, Sean Alexander. This manuscript underwent editorial and peer review, and was published open access in the journal *International Journal of Personality Psychology* in April 2023. The journal citation for this manuscript is:

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Crafting Happiness from Everyday Life: Personality, Personal Projects, Basic Psychological Need Satisfaction, and Well-Being

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Abstract

Introduction: Feeling competent, related, and autonomous promotes well-being through satisfying basic psychological needs, according to Self-Determination Theory. Personal projects are personally relevant goal-directed activities that take place over an extended period of time. The quality of life elicited from pursuing personal projects depends on the degree to which projects provide a sense of relatedness, competence, and autonomy. We expected that, when controlling for perfectionistic standards and discrepancies, achievement striving would lead to the pursual of projects that provide a sense of competence, which in turn would lead to well-being. We also explored autonomy and relatedness as mediators. Methods: The sample (N = 327) was composed of students and the general adult population who provided information on positive mental health, passion, zest for life, life purpose, personality, basic psychological need satisfaction, and personal projects. We used a cross-sectional survey design and tested hypotheses with twelve serial mediation models. Results: Achievement striving and personal standards were positively associated with competence, which in turn predicted well-being in 12 of 12 indirect effects tested. Achievement striving, personal standards and discrepancies contributed to change in well-being through relatedness or autonomy in 9 of 24 of exploratory indirect effects tested. Discussion: Those oriented toward achievement motivation are likely to feel competent in their pursuits (personal projects), which in turn promotes well-being.

Keywords: personal projects, well-being, basic psychological needs, personality, serial mediation

Crafting Happiness from Everyday Life: Personality, Personal Projects, Basic Psychological Need Satisfaction, and Well-Being

Feeling competent, related, and autonomous (i.e., satisfying basic psychological needs) is beneficial for well-being. Engaging in activities that facilitates these feelings (need-relevant activities) can be an intentional way in which happiness is increased. Moreover, personality traits may predispose people to meet certain kinds of basic needs, which in turn influences their well-being (high-achieving people might spend their free time learning new skills). The purpose of this project is to identify the relationships between achievement-related personality traits, basic psychological need satisfaction, need-relevant activities (personal projects), and well-being.

Self-Determination Theory

The meta-theory of SDT is comprised of six mini theories (1) causality orientations theory, (2) goal contents theory, (3) cognitive evaluation theory, (4) relationships motivation theory, (5) basic psychological needs theory, and (6) organismic integration theory (Legault, 2017). Together they explain personality and human motivation. The premise of SDT is that humans come to be innately active, intrinsically motivated, and oriented toward developing naturally (Deci & Ryan, 2012). Central to the present research is the basic psychological needs (BPN) mini-theory, which proposes that individuals have BPNs, and their associated fulfilment is essential to obtaining well-being (Deci & Ryan, 2000). Both Vansteenkiste et al. (2020) and Deci and Ryan (2000) describe three needs (autonomy, competence, and relatedness) as psychological in nature, as essential for psychological growth, integrity, and wellness, as an inherent part of human functioning, experientially and dynamically distinct from each other, and as universal. Autonomy is concerned with one's volition and willingness. When the need for autonomy is satisfied, people may feel free, self-directed, and integrated. Competence is achieved when people use their skills and expertise while completing an activity. When the need for competence is fulfilled, people may experience feelings of effectiveness

and mastery. Relatedness is concerned about feeling connected and important to people, and this results in feeling love, care, and connectedness when achieved. According to the BPN theory, all three needs ought to be satisfied to obtain optimal psychological health while failure to fulfil those needs may lead to negative outcomes such as ill-being and psychopathology. A fundamental aspect to BPN theory is that social environments can either support or thwart the fulfilment of the three BPNs (Legault, 2017). For instance, autonomy-supportive environments (relationships supportive of the person's need for autonomy) and encourage internalization of motivation as they provide space for choice. Likewise, competence-supportive environments (relationships that offer challenge) allow for skills and abilities to develop while relatedness-supportive environments (accepting relationships) allow for self-acceptance and expression of a person's authentic self. Social environments that support the fulfilment of the three BPNs are associated with positive life outcomes while social environments that thwart the fulfilment of the three BPNs are associated with negative life outcomes (Adams et al., 2017). The necessity and importance of the BPNs have been established as having mediating effects for social contexts and well-being (Deci & Ryan, 2012).

Personal projects are goal-directed activities that are personally relevant, that take place over an extended period of time (American Psychological Association, 2020; Little, 2014), and can serve as a social environment in which BPNs are supported or thwarted (act as need-relevant activities). With personality shaping the types of projects pursued (i.e., personally relevant and goal-directed) and the likelihood of satisfying needs shaped by environmental contexts, there is a pathway from personality to personal project pursual to psychological needs to well-being that is worth investigating.

Well-Being

In the present study, we take a multifaceted approach to measuring well-being, including various psychological feelings and functions: overall positive mental health (i.e., flourishing), being

enthusiastically engaged with life (i.e., zest), feeling a sense of purpose to one's life (eudaimonia), and being passionate about activities one does. Although these measures vary from trait-like constructs (zest, purpose) to domain-specific (passion about activities) to traditional well-being outcome measurement (overall positive mental health), we use each construct as an outcome in our models to better understand the ways in which personality-driven need satisfaction is related to the multi-faceted concept of well-being. Each dimension of well-being is described below.

Zest for life (George et al., 2016) represents a will to live, linked to both higher well-being (Park et al., 2004) and lower ill-being (Harrison et al., 2014). Zest for life is theorized to counteract feeling a lack of belonging which can be a precursor to suicidal ideation (Collins, 2018; George et al., 2016). A key component of zest is having a positive future outlook; however, zest is a broader construct than optimism as it also captures current engagement with and enthusiasm about life (Collins et al., 2018). Trait-level zest has been identified as one of the character strengths most strongly linked to hedonic well-being (Park et al., 2004; Peterson et al., 2007), and it has been linked to persistence in life (Hausler et al., 2017).

Eudaimonic well-being, commonly measured through the proxy of purpose in life, reflects the extent to which people pursue a life of virtue and their full human potential (Ryan & Deci, 2001; Scheier et al., 2006). Experiencing intrinsic motivation (i.e., authentic and generated from the self; Deci & Ryan, 2000) may result in finding value in activities (Vansteenkiste et al., 2020), which can then lead to a feeling of purpose to people's life.

Passion, a strong feeling toward a personally important activity that motivates intentions and behaviours to pursue that activity (Sigmundsson, 2020), is beneficial to well-being when it is considered harmonious. That is, when an activity becomes part of an individual's identity without any constraints or contingencies associated with it (i.e., autonomous internalization of an activity; Vallerand, Pelletier, & Koestner, 2008), it can enhance well-being and give meaning to everyday life,

constituting one avenue toward a more fulfilling life (Carpentier, Mageau, & Vallerand, 2012). For example, individuals who use their signature strengths (i.e., utilize their talent or virtues) tend to experience harmonious passion, which boosts well-being (Forest et al., 2012). Experiencing strong harmonious passion can lead to the experience of flow (i.e., when pursuing that passion), which then leads to higher well-being (Carpentier et al., 2012). Overall, passion has distinct consequences for well-being, and is conceptualized as being closely intertwined with the BPN of autonomy.

Personal Projects

Little (1989) coined the concept of personal projects, which refers to goal-directed activities that are personally relevant and that take place over an extended period (American Psychological Association, 2020; Little, 2014). Personal projects encompass activities that range from daily routine tasks to important commitments and aspirations. Personal projects are extended sets (i.e., composed of interrelated actions that occur over a sequence of time and space) of personally salient (i.e., represents an important aspect of the actor's life), action-oriented (i.e., intentional on behalf of the actor and requires cognitive, affective, conative, and volitional processes), and contextual (i.e., project occurs in physical, social, cultural, and temporal contexts that can encourage or undermine it; Little & Coulombe, 2015) ways to use one's time. Personal projects fall somewhere between people's routine on a Tuesday morning and grander life pursuits.

Like BPNs, research suggests that the quality of life elicited from pursuing personal projects depends on the degree to which personal projects provide a sense of relatedness, competence, and autonomy. Personal projects that promote well-being also tend to be meaningful, manageable, not overly stressful, supported by others, and they have the potential to improve people's lives (Little, 1989). When examining the role of need-fulfilment across six life domains (i.e., family, friends, relationships, school, work, and activities) with regards to well-being, Milyavskaya and Koestner (2011) found that individuals experienced greater well-being across life domains when they lead to

need-fulfilment. General need-fulfilment, as proposed by the SDT, has been established to influence well-being, and we propose that pursuing need-relevant activities is a unique way to increase happiness.

Perfectionism and Achievement-Oriented Personality Traits

The Almost Perfect Scale-Revised (APS-R) is a multidimensional model of perfectionism developed through a series of studies investigating how perfectionism is described in dictionaries (Slaney et al., 2001), and is comprised of three dimensions: personal standards, discrepancies, and order.[1,2] This model of perfectionism was based on a series of studies in the 1990s that used factor analyses to show a consistent positive dimension of perfectionism (see Slaney et al., 2001). Using the APS-R model, personal standards entail aiming and striving to be perfect but to a degree beyond the typical demanding standards of achievement striving individuals (Gaudreau, 2019). When those with higher personal standards feel their performance is not meeting their stringent standards, a discrepancy exists between standards and perceived performance. Discrepancy (i.e., feeling that one's performance is not meeting their standards) is what characterizes this often-distressing dimension of perfectionism (Rice & Ashby, 2007). Discrepancies are generally associated with lower well-being, such as life satisfaction (Rice & Ashby, 2007) and shame (Fedewa et al., 2005).

Having higher personal standards has been linked to well-being, such as through correlations between domain-specific personal standards (i.e., academic achievement) and well-being (Levine & Milyavskaya, 2018). Adaptive perfectionists (i.e., those with high personal standards and relatively low discrepancies) generally report feeling happy and satisfied in life (Chan, 2012); the standards subscale of the APS-R (Slaney et al., 2001) generally shows small negative correlations with maladaptive outcomes (mental ill-health) and small positive correlations with adaptive outcomes (life satisfaction; Lo & Abbott 2013; Wang et al., 2009). Suh et al. (2017) found that adaptive perfectionists reported the highest levels of presence of meaning, subjective happiness, and life

satisfaction, all of which were significantly higher than the corresponding scores of maladaptive perfectionists. Correspondingly, the discrepancy subscale tends to negatively correlate with well-being (life satisfaction; Rice et al., 2019).

Achievement striving is one of the most criterion-valid facets of conscientiousness (Dudley et al., 2006). Those who strive for achievement are characterized as hard working, ambitious, and resourceful (Drasgow et al., 2012), which manifests in behaviours associated with working toward goals and other positive outcomes. Achievement striving (and its higher-order factor conscientiousness) is characterized by the ability to delay gratification in the pursuit of goals (Roberts et al., 2009), and it has been identified as a major personality determinant of human health and well-being at a magnitude comparable to major health determinants such as socio-economic status (Roberts et al., 2009). A meta-analysis by Smith et al. (2019) reported a strong correlation ($r = .49$) between personal standards and conscientiousness across 77 studies. In Rice and Ashby's (2007) model of perfectionism, the APS-R is sometimes used to identify perfectionists, and it further distinguishes between adaptive (i.e., high standards without discrepancy) and maladaptive (i.e., high standards with discrepancies) perfectionism. This latter distinction stems from the early work of Hamachek (1978) who identified the distinction between normal and neurotic forms of perfectionism.

Adaptive perfectionism entails holding high personal standards coupled with the ability to feel accomplished and satisfied when those standards are met. That is, a small margin for minor errors in their performance is allowed; this flexibility acts as a buffer against distress when errors are made (c.f. Lo & Abbot, 2013). On the other hand, holding rigidly high personal standards with no room for mistakes can lead to discrepancies when mistakes do happen (Slaney et al., 2001). Stoeber et al. (2006) argue that having high personal standards can be adaptive, while other researchers believe that high personal standards are not truly expressions of perfectionism (Blasberg et al., 2016).

For example, the Canadian perfectionism experts Flett and Hewitt (2006) previously called for high personal standards to be conceptualized as a healthy dimension of conscientiousness (as achievement striving is) rather than an adaptive dimension of perfectionism. A repercussion of this argument is that any positive relationship between personal standards and well-being could be attributed to the conceptual overlap that personal standards share with achievement striving, which is known to be a healthy personality trait. Though we hold the view that personal standards as measured by the APS-R are conceptually distinct from achievement striving and that they form a psychological construct of potential interest for well-being, we hold no strong view on whether it should be considered a measure of "perfectionism." Nonetheless, the debates described above make it clear that a model including APS-R standards should simultaneously incorporate discrepancies and achievement striving to disentangle the conceptual overlap between all three constructs.

The relationships between achievement striving, personal standards, discrepancies, and well-being can be tested in the context of personal projects. Considering personal projects as a unit of analysis which uniquely capture features of both individuals and the contexts in which they act (Little, 2007), the basic psychological need competence can be satisfied or thwarted at the psychological (i.e., general BPN) and situational (i.e., specific personal project) level. People with high personal standards likely occupy social environments in which there is ample opportunity to achieve and meet their competence needs. Thus, people high in personal standards (after controlling for discrepancies) will tend to meet their competence needs more frequently, in turn leading to increased well-being. Achievement-oriented individuals tend to structure their core life projects in a way that supports their personal strivings (higher academic performance), which elicit feelings of efficacy and achievement (Little et al., 1992). Overall, both achievement striving and personal standards should be positively related to well-being through competence at the psychological (i.e.,

general BPN) and situational (i.e., specific personal project) level. Similarly, discrepancies should be negatively related to well-being by thwarting basic psychological needs. Discrepancies may be particularly detrimental for the basic psychological need relatedness, as perfectionism can facilitate social disconnection via negative social behaviours, cognitions, and outcomes (Sherry et al., 2015). That is, when discrepancies exist, interpersonal conflict and subjective social disconnection arise, which impedes relatedness.

The Present Study

Given the literature review above (Adams et al., 2017; Deci & Ryan, 2012; Little, 1989; Rice & Ashby, 2007; Vansteenkiste et al., 2020), we first predict that the two dimensions of the APS-R, personal standards and discrepancies, will be related to well-being in opposite directions.

H1: Discrepancies will be negatively related to well-being when controlling for personal standards and achievement striving.

H2: Personal standards will be positively related to well-being when controlling for discrepancies and achievement striving.

The predictions of the SDT hold that a social context conducive of meeting basic psychological needs (a personal project that is more likely to meet competence needs) will result in basic psychological needs being met, which in turn leads to well-being (Deci & Ryan, 2012). Thus, combining this with predictions made in H1 and H2 we also predict a serial mediation model:

H3: The total effects in H1 and H2 will be serially mediated by pursual of personal projects that provide a sense of project competence and meet the basic psychological need of competence.

Finally, though our hypotheses focus primarily on the competence dimension, we also ran exploratory models exploring the role of relatedness and autonomy, given their centrality to well-being in the SDT. As per the social disconnection model (Sherry et al., 2015), interpersonal conflict

generated by experiencing discrepancies inherent in maladaptive perfectionism likely thwarts relatedness. Thus, a broad research question was also:

RQ1: What relationships are observed when competence is replaced with autonomy and relatedness, respectively?

Method

Participants

The sample size was determined with a precision analysis. Assuming a correlation of $r = .21$, and a desired 95% confidence interval width of ± .10, we planned to recruit a sample size of $N = 352$. Due to a lack of established correlations between personal projects and well-being, the average correlation in social psychology research (r = 0.21) was used (Richard et al., 2003). A total of 367 participants were recruited. Out of the 367 participants, data entries from 40 were removed because they either did not complete the survey in full or filled out the survey more than once with the same answers. This yielded a total sample size of 327 participants, slightly under our target sample size but still within acceptable tolerance, and resulting in a precision of ±0.1035.[3] The sample was divided into two groups: undergraduate psychology students at a large Atlantic Canadian university (N = 214) and adults from an Atlantic Canadian community sample ($N = 113$). The undergraduate psychology students were recruited via the SONA system, which is Dalhousie University's online platform housing the undergraduate student participant pool. Students were granted 0.5 bonus points to their course grade following the completion of the online survey. The SONA recruitment began in January of 2021 and finished at the end of the winter term (i.e., April 2021). Participants from the community sample were recruited through flyers and online advertisements in exchange for entering a lottery for a $50 gift card. The community recruitment began in January 2021 and

finished in February 2022. Because the processes under study likely generalize to both populations,[4] the two samples were merged into a single dataset, using sample (SONA vs. community) as a covariate. The participant's age ranged between 17 and 72, with an average age of 24.95 (*SD* = 10.49). Further demographic statistics are given in Table 4.1.

Measures

Descriptive statistics on key study variables, including internal reliability for each measure, are displayed in Table 4.2. Copies of all materials and measures used in this study, including measures not examined in the present paper, can be found on our OSF page https://osf.io/f4stj/.

Personal Project Analysis

The Personal Project Analysis (PPA; Little & Coulombe, 2015) was used to measure an individual's pursual of, and feelings toward, personal projects. It begins with project elicitation where participants identify their personal projects with an open-ended text field. The next step requires participants to identify their attitudes about their personal projects (Little & Coulombe, 2015). In our study, participants were asked to list up to three personal projects they deemed most important with regards to their everyday life. Next, they rated their projects on a 10-point unipolar scale from Little's (1983) original Personal Project Analysis workbook. In relation to need satisfaction at the personal project level, we used three relevant items: autonomy, competence, and relatedness (Table 2, under "project need satisfaction"). The autonomy dimension refers to the level to which people feel like they are freely engaging in the personal project (Little, 1983). The competence dimension refers to the level to which people feel competent enough to carry out the personal project. The

[4] Bivariate correlations with sample source showed weak, positive correlations between being a student and the achievement-related personality variables, with a null relationship to basic psychological need satisfaction or well-being.

relatedness dimension refers to the level to which people feel their personal project is supported (emotionally, financially, or practically) by others.

In this study, the ratings were averaged across each personal project for each of the three respective dimensions. The PPA has been identified as having a moderate test-retest reliability, which is qualified as satisfying considering the possible fluctuation in personal projects (Little & Coulombe, 2015). A moderate alpha coefficient (median α across all project dimensions = 0.70) has previously been found in other research (Little et al., 1992), indicating adequate internal consistency. The personal project dimensions are also generally positively related with well-being, demonstrating criterion validity (Little, 2011). There is little information published on the psychometric properties of the three dimensions (i.e., autonomy, competence, and relatedness) used in this study; the findings from this study hopefully provide insight into their psychometric characteristics.

Modified BPN Satisfaction Scale

The Modified BPN Satisfaction Scale (Hadden & Smith, 2019) measures satisfaction of the three BPNs (i.e., autonomy, competence, and relatedness) within BPN theory (Legault, 2017) and it is a shortened measure based on Sheldon et al.'s (2001) original BPN Satisfaction Scale. The revised scale is composed of six items with which participants had to indicate their level of agreement on a 7-point scale (i.e., how true the statements were in the past week; 1 = not true at all, to 7 = very true) which were then averaged. Items one and two measure feelings of autonomy (sample item: "I felt that my choices were based on my own interests and values"). Items three and four measure feelings of competence (e.g., "I felt very capable in what I do"). Items five and six measure feelings of relatedness (e.g., "I felt close and connected with other people"). Hadden and Smith (2019) previously indicated internal consistencies of α = 0.82 for the autonomy competent, α = 0.62 for the competence component, and 0.83 for the relatedness component. The three components were also identified as predictors for meaning in life (Hadden & Smith, 2019).

Well-Being Measures

Well-being was measured in four ways: positive mental health, passion, zest for life, and life purpose.

Mental Health Continuum-Short Form. This scale is used to measure positive mental health, covering emotional, social, and psychological well-being through subscales (Keyes, 2007). It is composed of 14 items; participants had to rate each item on a 5-point scale (0 = never, 1 = once or twice, 2 = about once a week, 3 = a couple times a week, 4 = almost every day, 5 = every day), which were then averaged. Participants rated their frequency of experiencing feelings of emotional, social, and psychological well-being in the last month. Items one to three measure feelings of emotional well-being (e.g., happy"). Items four to eight measure feelings of social well-being (e.g., "that you had something important to contribute to society"). Items nine to fourteen measure feelings of psychological well-being (e.g., "thar you liked most parts of your personality"). A total averaged over the 14 items was used for the analysis, representing positive mental health. The Mental Health Continuum-Short Form scale has previously shown strong convergent validity and good criterion validity (Keyes et al., 2008, Petrillo et al., 2014).

Zest for Life Scale. This scale measures general engagement with and enthusiasm for life (George et al., 2016) with an average of 12 items (sample item: "I try to enjoy life no matter what") and has previously shown excellent internal consistency (0.96) and good convergent validity (Collins et al., 2016).

Life Engagement Test. This scale measures purpose in life, conceptualized as the extent to which an individual engages in activities that are personally valued (Scheier et al., 2006). Participates rated agreement on items of purpose (e.g., "I have a lot of reasons for living") which were then averaged. The Life Engagement Test has previously shown moderate test-retest reliability and convergent validity (Scheier et al., 2006).

Passion Scale. Passion is quantified using a newly established, 8-item scale that assesses passion toward achieving a skill (Sigmundsson et al., 2020). Participants rated the level of passion and interest in a general theme or skill (e.g., "I use a lot of time on the projects I like") which were then averaged. The Passion scale has previously shown high content validity, test re-rest reliability (0.92) and internal consistency (0.86; Taylan et al., 2020).

Personality Variables

Three personality traits were measured: achievement striving, personal standards, and perfectionistic discrepancies.

Achievement Striving Facet Scale. This scale measures the facet achievement striving from the conscientiousness factor of the Five Factor Model (McCrae & John, 1992). Goldberg et al. (1999) created the International Personality Item Pool (IPIP)[8] to conceptually duplicate Costa and McCrae's (1992) items measuring the Five Factor Model, which were averaged. Participants rated agreement on 10 items (e.g., "Plunge into tasks with all my heart"). The Achievement Striving Facet Scale has previously shown moderate test-retest reliability ($\alpha = 0.78$; Goldberg et al., 1999).

Personal standards and perfectionistic discrepancies. We used two subscales from the Almost Perfection Scale-Revised (APS-R; Slaney et al., 2001) that measure personal standards (aiming and striving to be perfect) and perfectionistic discrepancies (feeling that one's performance is not meeting their standards). Participants rated agreement on 7 items for personal standards (e.g., "Set high standards for myself and others") and 12 items for perfectionistic discrepancies (e.g., "I often feel frustrated because I can't meet my goals"), which were then averaged. Both subscales have previously shown high test-retest reliability (Personal standards: $\alpha = 0.85$; perfectionistic discrepancies: $\alpha = 0.92$) and evidence for convergent validity (Slaney et al., 2001).

Procedure

The research was approved by the Institutional Research Ethics Board (2020-5376). The undergraduate psychology students who registered for this study via the SONA system were required to log onto the SONA platform using their university account, where they were given a link to the survey. The survey was administered through SurveyMonkey, a paid online survey platform. The order of the questionnaires was administered as follows: Modified BPN Satisfaction Scale (Hadden & Smith, 2019), Mental Health Continuum Short-Form (Keyes, 2007), Passion scale (Sigmundsson et al., 2020), Zest for Life (George et al., 2016), Life Engagement Test (Scheier et al., 2006), and Personal Project Analysis (Little, 1983). Since the PPA requires more time, it was administered last so that participants would not be overwhelmed and fail to complete the whole questionnaire. Participants needed access to the internet and to an electronic device (i.e., computer, mobile phone, or tablet) to complete the survey. Participants from the general population either a) saw a flyer in the community and emailed the principal investigator for the survey link, or b) saw an advertisement online with a direct link to the survey. The questionnaire took about 25 minutes to complete. At the end of the questionnaire, a link was provided to enter an email address for the $50 gift card draw.

Analytic Plan

The data, syntax, codebook, and questionnaires used in this study can be found on our OSF page (https://osf.io/f4stj/). Serial mediation models were tested using the lavaan package in R. This type of model tests the hypothesis that personality predicts the first mediator (personal project need satisfaction), which in turn predicts the second mediator (BPN satisfaction), which in turn predicts the outcome (well-being). Sample source (undergraduate participant pool = 1) was added as a covariate to each model. Mediation is a statistical term that means that the relationship between

personality and well-being gets smaller after accounting for the two need satisfaction variables (see Figure 4.1 for a conceptual model). There is a total of 12 tests because there are 3 need satisfaction types (relatedness, competence, & autonomy) and 4 well-being measures (3 x 4 = 12). All three personality variables are entered together as predictors in each model (see Table 4.2 for a list of all variables).[4] Because all models are fully saturated models, there are no fit indices to report. Standard errors for all parameters were estimated using bootstrapping in *lavaan* with 5000 resamples. Both unstandardized and standardized (β) coefficients are reported. For brevity of exposition, we report only the standardized total effects and the total serial indirect effects in the body of the text, which reflect our hypotheses.[5-6] However, coefficients for all 12 path models (i.e., our main hypothesized models and exploratory models) are presented in the online supplementary materials in Tables S1-S12 (https://ijpp.rug.nl/article/view/39811/36943).

Missing Data

Due to a survey preparation error, the last item on the MHC-SF (psychological well-being subscale: "Confident to think or express your own ideas and opinions") was not included until about halfway through data collection. The item does not have data from about half of the sample (N = 165), primarily those who provided answers to the survey early in the data collection period. When calculating the total score, we omitted the item, resulting in a 13-item measure of overall positive mental health. At the scale total level, missing data ranged from 1.2-s5.2%. Missing data was handled using a full information maximum likelihood approach for hypothesis testing and using listwise deletion for descriptive statistics.

Results

Correlations between key study variables are presented in Figure 4.2.[7] Each model tests indirect effects leading from achievement striving (when controlling for personal standards and

perfectionistic discrepancies) to personal project (PP) need satisfaction, through to basic psychological need satisfaction, then to well-being. Models 1-4 represent competence with each well-being measure; indirect effects are displayed in Table 4.3. Models 5-8 represent relatedness with each well-being measure; indirect effects are displayed in Table 4.4. Models 9-12 represent autonomy with each well-being measure; indirect effects are displayed in Table 4.5.

Model 1: Competence & Positive Mental Health

We found three serial indirect effects, wherein personality traits (i.e., achievement striving, personal standards, and discrepancies; see the first three rows of the Personality column in Table 4.3) indirectly predicted positive mental health through PP competence and BPN competence (see the Indirect effect columns in Table 4.3). Achievement striving had a small serial indirect effect through the two competence variables, β = .10, 95% CI [.03, .17]. Personal standards had a small serial indirect effect through the two competence variables, β = .14, 95% CI [.05, .22]. Finally, discrepancies had a small serial indirect effect through the two competence variables, β = -.12, 95% CI [-.17, -.06]. The covariance matrix in this model showed that sample was positively related to achievement striving, highlighting that the student sample tended to report higher achievement striving.

Model 2: Competence & Zest for Life

We found three serial indirect effects, wherein personality traits (i.e., achievement striving, personal standards, and discrepancies) indirectly predicted zest for life through PP competence and BPN competence (see second set of three rows in Table 4.3). Achievement striving had a small serial indirect effect through the two competence variables, β = .06, 95% CI [.001, .12]. Personal standards had a small serial indirect effect through the two competence variables, β = .09, 95% CI [.03, .15].

Finally, discrepancies had a small serial indirect effect through the two competence variables, β = -.07, 95% CI [-.13, -.02].

Model 3: Competence & Life Purpose

We found three serial indirect effects, wherein personality traits (i.e., achievement striving, personal standards, and discrepancies) indirectly predicted life purpose through PP competence and BPN competence (third set of three rows in Table 4.3). Achievement striving had a small serial indirect effect through the two competence variables, β = .09, 95% CI [.03, .15]. Personal standards had a small serial indirect effect through the two competence variables, β = .10, 95% CI [.03, .16]. Finally, discrepancies had a small serial indirect effect through the two competence variables, β = -.09, 95% CI [-.15, -.04].

Model 4: Competence & Passion

We found three serial indirect effects, wherein personality traits (i.e., achievement striving, personal standards, and discrepancies) indirectly predicted passion through PP competence and BPN competence (fourth set of three rows in Table 4.3). Achievement striving had a small serial indirect effect through the two competence variables, β = .09, 95% CI [.03, .14]. Personal standards had a small serial indirect effect through the two competence variables, β = .09, 95% CI [.02, .15]. Finally, discrepancies had a small serial indirect effect through the two competence variables, β = -.09, 95% CI [-.14, -.04].

Model 5: Relatedness & Positive Mental Health

We found one serial indirect effect, wherein achievement striving) indirectly predicted positive mental health through PP relatedness and BPN relatedness, but personal standards and discrepancies did not (first set of three rows in Table 4.4). Achievement striving had a small serial indirect effect through the two relatedness variables, β = .09, 95% CI [.01, .17]. Indirect effects were

non-significant for personal standards β = .06, 95% CI [-.02, .15] and discrepancies β = -.06, 95% CI [-.12, .01].

Model 6: Relatedness & Zest for Life

We found one serial indirect effect, wherein achievement striving indirectly predicted zest for life through PP relatedness and BPN relatedness, but personal standards and discrepancies did not (second set of rows in Table 4.4). Achievement striving had a small serial indirect effect through the two relatedness variables, β = .06, 95% CI [.004, .12]. Indirect effects were non-significant for personal standards β = .04, 95% CI [-.01, .09] and discrepancies β = -.04, 95% CI [-.09, .02].

Model 7: Relatedness & Life Purpose

We found one serial indirect effect, wherein achievement striving indirectly predicted life purpose through PP Relatedness and BPN relatedness, but personal standards and discrepancies did -not -(third set of rows in Table 4.4). Achievement striving had a small serial indirect effect through the two relatedness variables, β = .06, 95% CI [.003, .12]. The serial indirect effect for personal standards was nonsignificant,β= .04, 95% CI [-.01, .10]. Similarly, discrepancies had a nonsignificant serial indirect effect, β= -.04, 95% CI [-.09, .01].

Model 8: Relatedness & Passion

None of the three serial indirect effects predicting passion through PP relatedness and BPN relatedness were statistically significant (fourth set of rows in Table 4.4). Indirect effects were nonsignificant for achievement, β= .04, 95% CI [-.001, .09], personal standards, β= .03, 95% CI [-.01, .07], and discrepancies, β= -.04, 95% CI [-.09, .01].

Model 9: Autonomy & Positive Mental Health

We found one serial indirect effect, wherein personal standards indirectly predicted positive mental health through PP autonomy and BPN autonomy, but achievement striving, and discrepancies did not (first set of three rows in Table 4.5). Personal standards had a small serial indirect effect on zest for life, β= .11, 95% CI [.03, .18]. Indirect effects were nonsignificant for achievement striving, β= .05, 95% CI [-.01, .11], and discrepancies, β= -.003, 95% CI [-.05, .04].

Model 10: Autonomy & Zest for Life

We found one serial indirect effect, wherein personal standards indirectly predicted zest for life through PP autonomy and BPN autonomy, but achievement striving and discrepancies did not (third set of three rows in Table 4.5). Personal standards had a small serial indirect effect on zest for life, β= .10, 95% CI [.03, .16]. Indirect effects were nonsignificant for achievement striving, β= .05, 95% CI [-.01, .11], and discrepancies, β= -.01, 95% CI [-.05, .03].

Model 11: Autonomy & Life Purpose

We found two serial indirect effects, wherein achievement striving and personal standards indirectly predicted life purpose through PP autonomy and BPN autonomy, but discrepancies did not (second set of three rows in Table 4.5). Achievement striving had a small serial indirect effect through the two autonomy variables, β= .05, 95% CI [.003, .10]. Personal standards also had a small serial indirect effect, β= .08, 95% CI [.01, .14]. However, discrepancies had a nonsignificant indirect effect through the two autonomy variables, β= -.03, 95% CI [-.06, .01].

Model 12: Autonomy & Passion

We found two serial indirect effects, wherein achievement striving and personal standards indirectly predicted passion through PP autonomy and BPN autonomy, but discrepancies did not (fourth set of three rows in Table 4.5). Achievement striving had a small serial indirect effect on

passion through the two autonomy variables, β= .06, 95% CI [.01,.12]. Personal standards also had a small serial indirect effect on zest, β= .09, 95% CI [.02, .16]. However, discrepancies had a nonsignificant indirect on passion effect through the two autonomy variables, β= -.03, 95% CI [-.07, .01].

Discussion

The purpose of this study was to identify the relationships between personality factors (achievement striving, personal standards, and discrepancies), positive psychological processes (BPN satisfaction), personally valued activities (personal projects), and well-being (passion, zest for life, life purpose, positive mental health). Researchers have previously called for high personal standards to be conceptualized as a healthy dimension of conscientiousness (as achievement striving is) rather than as an adaptive dimension of perfectionism (Flett & Hewitt, 2006). For this conceptualization to hold, any positive relationship between personal standards and well-being should be attributed to the conceptual overlap of personal standards and achievement striving. Thus, to disentangle the conceptual overlap between all three constructs, our models simultaneously incorporated discrepancies and achievement striving. Discrepancies were negatively related to well-being while controlling for personal standards and achievement striving, thus supporting H1. Similarly, high personal standards was still positively predictive of well-being after controlling for achievement striving and discrepancies, thus supporting H2. Finally, competence serially mediated the relationship between both APS-R perfectionism variables and well-being, thus supporting H3. In the sections that follow, we discuss the nuances across all 12 serial mediation models.

Competence and Well-Being

Perfectionistic discrepancies were indirectly related to lower well-being, while both personal standards and achievement striving were indirectly related to higher well-being. These relationships

held regardless of the type of well-being (i.e., passion, zest for life, life purpose, positive mental health), potentially because competence has been identified as the strongest BPN predictor for individual well-being (Patrick et al., 2007). That is, competence may be so strongly linked to well-being that the relationship is captured across dimensions or types of well-being. Those with high personal standards are characterized by holding high expectations for performance, striving for excellence, and expecting the best out of oneself (Slaney et al., 2001). Thus, those who strive for achievement are characterized by holding high expectations for their performance as well as others', concerned with turning plans into actions, and demanding high quality (Costa et al., 1991).

Notably, having high personal standards is specific to the individual's own expectations and performance, while being high in trait achievement striving includes attitudes and perceptions beyond the self. In the present study, competence was the mechanism linking ambitious personality traits and well-being, particularly personal standards. As competence is an individual sense of capability, it may be more suitable to an individual-level motivation (i.e., meeting personal standards) rather than a motivation for everyone (i.e., self and others striving for achievement) when predicting well-being.

Those with high personal standards likely pursue personal projects related to personal strivings that elicit feelings of efficacy and achievement which in turn lead to well-being (Little et al., 1992), such as personal projects that are manageable and not overly stressful (Little, 1989). As the need for competence is particularly significant for achievement-oriented individuals, satisfaction of that need will provide a boost in well-being following the achievement of strivings, whether that is positive mental health, feeling purposeful and engaged in life, or increased passion. Participants with the highest sense of competence in their personal projects tended to be concerned with their education (finishing their degree and getting good grades). Similarly, those who reported frequently feeling competent (i.e., satisfied the BPN for competence) tended to report personal projects related

to intensive study, admission to competitive graduate programs, and getting "perfect" grade. The sample may be biased toward those who have an achievement-oriented disposition and whose well-being would benefit from feeling competent and capable. Feeling competent entails feeling capable in endeavors (Hadden & Smith, 2019), such as carrying out personal projects (Little, 1989). Holding confidence in one's capability to complete a project may facilitate feelings of having something important to contribute to society and feeling confident to express your ideas and opinions, two experiences reflected in well-being (Keyes, 2005).

Relatedness and Well-Being

Exploratory indirect effects for relatedness produced much less consistent results, with 3 of 12 indirect effects emerging as statistically significant (all achievement striving). Achievement striving was indirectly related to higher well-being through relatedness, for each type of well-being but passion. Interestingly, previous research has identified relatedness as the only BPN able to distinguish between adaptive and maladaptive forms of passion (Chamorro et al., 2020) yet it was the only BPN not related to passion in this study. Feeling supported by others in personal projects may include emotional (encouragement, approval), financial (money, material possessions) or practical (active assistance) support (Little, 1983). Relatedness has been identified as the strongest BPN predictor for relationship well-being (Patrick et al., 2007), which may help explain the relationship to positive mental health which contains social well-being (Keyes, 2005). Otherwise, each of the remaining three types of well-being are individual-focused, including perception of life's possibilities (zest for life), engagement in activities that are personally valued (life purpose), and interest in a general theme or skill (passion). Nonetheless, there was not broad support for relatedness as a mediator of the relationship between personality and well-being in these data.

Autonomy and Well-Being

Indirect effects for autonomy also tended to be smaller than effects found for competence, with only 6 of 12 serial indirect effects emerging as statistically significant (4 for personal standards, 2 for achievement striving). Having high personal standards and feeling autonomous was a significant pathway to well-being, regardless of the dimension of well-being (i.e., positive mental health, passion, zest for life, life purpose). Achievement striving indirectly led to well-being through feeling autonomous when the type of well-being was life purpose or passion. However, only personal standards indirectly predicted positive mental health. Overall, support for autonomy as a mediator was mixed.

Autonomy is concerned with people's violation and willingness (Vansteenkiste et al., 2020); when the need for autonomy is satisfied, one may feel free, self-directed, and integrated (Deci & Ryan, 2000). As personal projects are action-oriented (i.e., intentional; Little & Coulombe, 2015) and lead to experiences of intrinsic motivation (i.e., authentic and generated from the self; Deci & Ryan, 2000), they may be a natural avenue to exercise autonomy. That is, personal projects are characterized by what people choose to do with their lives, which requires some degree of autonomy. Passionate pursual of personal projects has been linked to well-being, and particularly, the experience of positive emotions (Vallerand et al., 2003). According to Vallerand's (2015) dualistic model of passion, well-being benefits most from activities that are autonomously internalized into one's identity (harmonious passion) rather than originated from external pressure to pursue the activity. That is, passionately pursuing projects leads to higher well-being when the activity is autonomously valued (harmonious passion). Those with particularly high standards who strive for achievement likely prefer to work toward their goals independently, rather than collaboratively. By avoiding overly collaborative work requiring trusting others with performance outcomes, achievers may feel particularly autonomous and in control of their performance. On the other hand,

constantly assuming full responsibility for all aspects of one's performance at the workplace or school could place one at risk for burnout.

Limitations and Future Directions

A primary limitation to this study was limited opportunity to recruit representative participants from the general population. Due to the pandemic restrictions, sampling methods for the general population were limited to posters and online advertisements to avoid social contact. To obtain the target sample size, we also recruited participants from the university participant pool, which is relatively homogenous in terms of gender and ethnic background. Essentially, our sample is predominated by White women, which limits the generalizability of the results. However, past research on women students in the same university participant pool has failed to show a gender moderation with perfectionism (Cowie et al., 2018).

A second limitation is concerned with measurement of personal projects and perfectionism. The original Personal Project Analysis is based on ten personal projects per participant. To reduce participant burden, we asked for three personal projects which may require participants to choose only essential, key projects, which tends to fall in major life domains such as education, work, and family. By reducing the number of personal projects, each participant was restricted in the comprehensiveness of the information they could provide about their day-to-day lives. By using the APS-R (Rice & Ashby, 2007) as our measure of perfectionism, we acknowledged the adaptive vs. maladaptive theoretical debate in the literature but did not complement the measurement of perfectionism with another multi-dimensional measure that would allow us to consider the target or source of expectations (Frost et al., 1990; Hewitt & Flett, 1996).

Finally, our cross-sectional serial mediation model is not without limits. Cross-sectional mediation uses only one measurement occasion, and therefore it is assumed that the cause and effect occur within the time of data collection and cannot demonstrate temporal precedence (Cain et al.,

2018). Given that it is well-known that covariation does not necessarily imply causation, any causal inferences made from these models are weak. Therefore, further study of the role of personal projects in satisfying basic psychological needs to improve well-being would be well situated for a longitudinal design to assess effects on well-being over time, such as random intercept cross-lagged panel effects between need satisfaction at both levels and well-being.

Conclusion

Striving for achievement and having high personal standards led to increased well-being and discrepancies led to decreased well-being when the BPN of competence was satisfied (in general and specific to personal projects). In fact, all three personality variables led to higher well-being through competence regardless of the type of well-being outcome. In contrast, results were mixed when considering relatedness or autonomy as mediators of the relationship between personality variables and well-being. Nonetheless, both relatedness and autonomy were correlated with well-being in the expected directions. Overall, these findings provide some counter-evidence to the contention that personal standards perfectionism (as measured by the APS-R) is exclusively maladaptive, and provides evidence that high personal standards is not simply synonymous with achievement striving.

Notes

[1] The Order subscales on the APS-R (Rice & Ashby, 2007) measure preference for order and organization. Order was not included in the study analysis because it is not used to classify perfectionists, as it is not considered a core dimension of perfectionism. We used the subscales Personal Standards and Discrepancies only.

[2] Other existing multidimensional models of perfectionism do not consider adaptiveness in the conceptualization. For example, Hewitt & Flett (1991) conceptualize perfectionism based on the source and target of expectations, including self-oriented, other-oriented, and socially prescribed

perfectionism. Frost et al. (1990) describes the dimensions of perfectionism in terms of experiences characteristic of perfectionism, including concern over making mistakes, high personal standards, the perception of high parental expectations, the perception of high parental criticism, the doubting of the quality of one's actions, and a preference for order and organization. These models remain valuable but are not under study in the present paper.

[3] For readers who prefer more conventional power analyses over precision analyses, a sensitivity power analysis in G*Power software shows that N = 327 can detect an effect size of r = .197 or smaller, assuming alpha of .05 and 95% power.

[4] The three needs were identified as being strongly correlated with each other in prior research (r = 0.64 for autonomy/competence, r = 0.62 for autonomy/relatedness, and r = 0.57 for relatedness/competence; Hadden & Smith, 2019); thus, including them together in a single multiple mediator model might result in multicollinearity.

[5] The reader is reminded that our primary hypotheses are on competence (4 models) and that autonomy and relatedness are explored as supplementary analyses (8 models).

[6] The reader is reminded that the total effect equals the direct effect (i.e., paths c", cc', and ccc' in Figure 4.1) plus the total serial indirect effect (see formulas in Figure 4.1). Thus, the total serial indirect effect is the amount that the total effect shrinks after controlling for both mediators.

[7] As shown in the bivariate correlation matrix in Figure 4.2, sample (0 = community, 1 = student) is positively albeit weakly correlated with achievement striving, personal standards, and perfectionistic discrepancies, indicating that these personality traits are generally higher in the student sample than the community sample. Sample was controlled for in all subsequent data analysis.

[8] The IPIP items can be found at: https://ipip.ori.org/newNEOKey.htm#Achievement-Striving.

Table 4.1

Demographic Characteristics

Variable	*M* (SD) or *N* (%)
Age	24.95 (10.49)
Ethnicity	
White	227 (76.95%)
Black	10 (3.49%)
Asian	58 (19.66%)
Student status	
Full-time student	251 (76.76%)
Part-time student	21 (6.42%)
Not a student	55 (16.82%)
Occupation status	
Full-time employee	42 (12.88%)
Part-time employee	130 (39.88%)
Unemployed	154 (47.24%)
Gender	
Woman	265 (81.04%)
Man	57 (17.43%)
Non-binary	4 (1.22%)
Prefer not to answer	1 (0.30%)

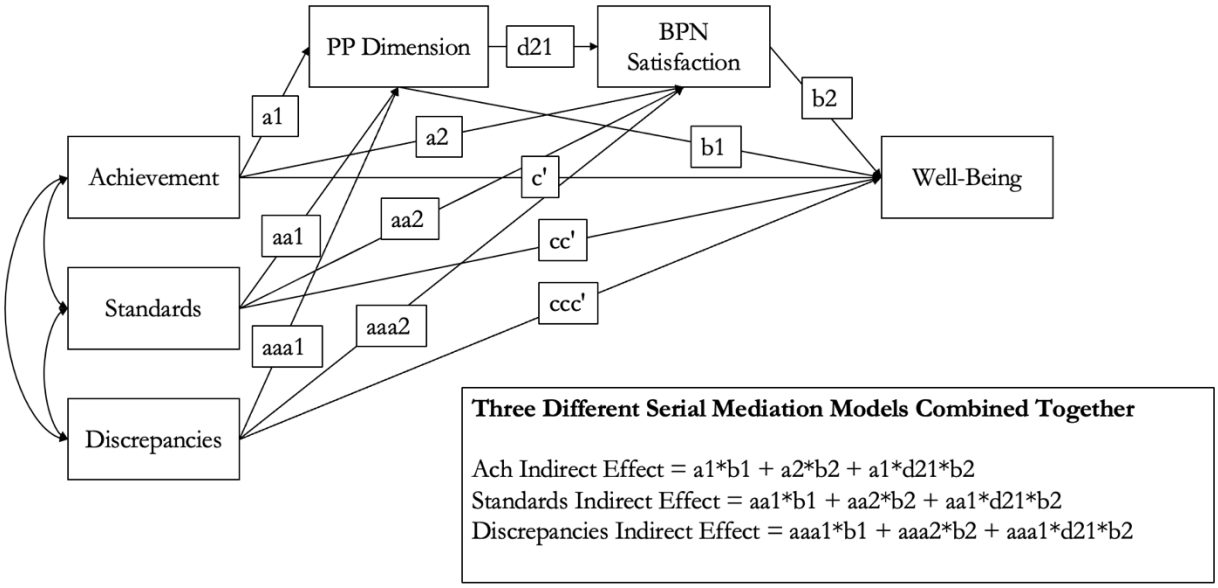
Table 4.2

Descriptive Statistics of Key Study Scales

Variable	*M* (SD)	Range	α	Items in measure
Basic psychological need satisfaction				
Autonomy	5.39 (1.28)	1-7	.86	2
Competence	5.09 (1.30)	1-7	.86	2
Relatedness	4.63 (1.65)	1-7	.84	2
Personal project need satisfaction				
Autonomy	8.22 (1.90)	0-10	.64	1
Competence	7.61 (1.93)	0-10	.68	1
Relatedness	4.63 (1.65)	0-10	.71	1
Well-being measures				
Positive mental health	3.88 (1.03)	1-6	.92	14
Passion	4.17 (0.81)	1-5	.90	8
Zest for Life	4.56 (1.21)	1-7	.92	12
Life Engagement	4.05 (0.56)	1-5	.82	6
Personality variables				
Personal standards	5.81 (1.03)	1-7	.89	7
Perfectionistic discrepancies	4.23 (1.43)	1-7	.95	12
Achievement striving	4.69 (0.55)	1-7	.89	20

Figure 4.1

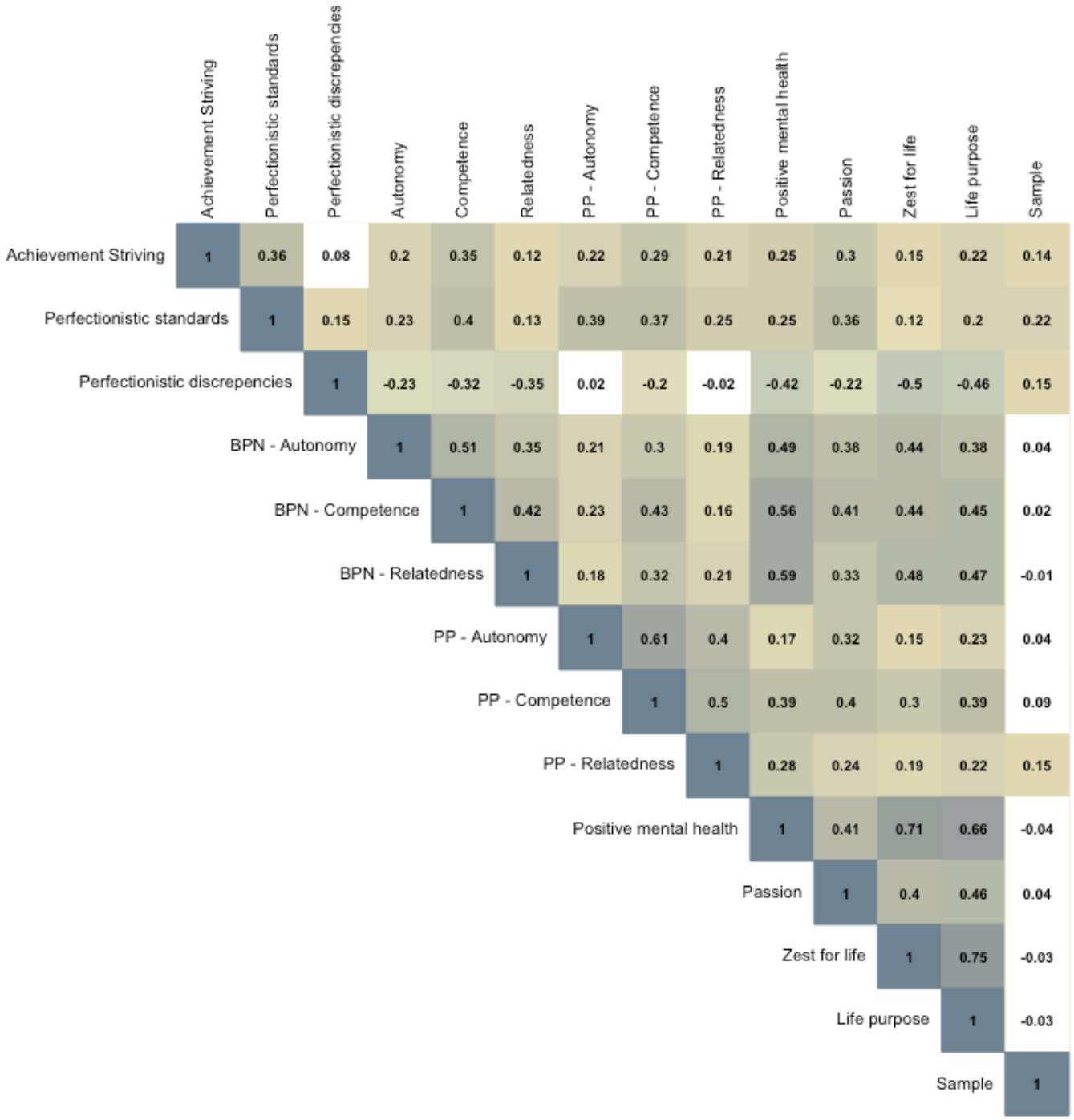
Serial Mediation Model Tested



Note. Sample source (0 = general adult population from community, 1 = undergraduate participant pool) was included as a covariate in all models, but not shown here for simplicity.

Figure 4.2

Bivariate Correlations Between Study Variables



Note. Sample: 0 = student sample and 1 = community sample

Table 4.3

Tests of Indirect Effects for the Serial Mediation Model With Personal Project Competence, Competence BPN Satisfaction, and Well-Being

Predictor (X)	Mediator (M1)	Mediator (M2)	Outcome (Y)	95% CI
Achievement Striving	PP Competence	BPN Competence	Positive Mental Health	**[.04, .15]**
APS-R Personal Standards	PP Competence	BPN Competence	Positive Mental Health	**[.11, .24]**
APS-R Discrepancies	PP Competence	BPN Competence	Positive Mental Health	**[-.21, -.08]**
Achievement Striving	PP Competence	BPN Competence	Zest for Life	**[.01, .11]**
APS-R Personal Standards	PP Competence	BPN Competence	Zest for Life	**[.04, .18]**
APS-R Discrepancies	PP Competence	BPN Competence	Zest for Life	**[-.16, -.03]**
Achievement Striving	PP Competence	BPN Competence	Life Purpose	**[.02, .13]**
APS-R Personal Standards	PP Competence	BPN Competence	Life Purpose	**[.06, .19]**
APS-R Discrepancies	PP Competence	BPN Competence	Life Purpose	**[-.17, -.05]**
Achievement Striving	PP Competence	BPN Competence	Passion	**[.02, .12]**
APS-R Personal Standards	PP Competence	BPN Competence	Passion	**[.06, .17]**
APS-R Discrepancies	PP Competence	BPN Competence	Passion	**[-.16, -.05]**

Note. Confidence intervals (CI) were derived using a Monte Carlo method with 5,000 resamples using standardized coefficients. PP = Personal Projects;

BPN = BPN; APS-R = Almost Perfect Scale – Revised.

Table 4.4

Tests of Indirect Effects for the Serial Mediation Model With Personal Project Autonomy, Autonomy BPN Satisfaction, and Well-Being

Predictor (X)	Mediator (M1)	Mediator (M2)	Outcome (Y)	95% CI
Achievement Striving	PP Autonomy	BPN Autonomy	Positive Mental Health	[-.01, .08]
APS-R Personal Standards	PP Autonomy	BPN Autonomy	Positive Mental Health	**[.07, .18]**
APS-R Discrepancies	PP Autonomy	BPN Autonomy	Positive Mental Health	[-.06, .03]
Achievement Striving	PP Autonomy	BPN Autonomy	Zest for Life	[-.01, .08]
APS-R Personal Standards	PP Autonomy	BPN Autonomy	Zest for Life	**[.06, .18]**
APS-R Discrepancies	PP Autonomy	BPN Autonomy	Zest for Life	[-.07, .02]
Achievement Striving	PP Autonomy	BPN Autonomy	Life Purpose	[.00, .07]
APS-R Personal Standards	PP Autonomy	BPN Autonomy	Life Purpose	**[.04, .15]**
APS-R Discrepancies	PP Autonomy	BPN Autonomy	Life Purpose	[-.08, .00]
Achievement Striving	PP Autonomy	BPN Autonomy	Passion	[.01, .09]
APS-R Personal Standards	PP Autonomy	BPN Autonomy	Passion	**[.06, .17]**
APS-R Discrepancies	PP Autonomy	BPN Autonomy	Passion	**[-.09, -.01]**

Note. Confidence intervals (CI) were derived using a Monte Carlo method with 5,000 resamples using standardized coefficients. PP = Personal Projects;

BPN = BPN; APS-R = Almost Perfect Scale – Revised.

Table 4.5

Tests of Indirect Effects for the Serial Mediation Model With Personal Project Support, Relatedness BPN Satisfaction, and Well-Being

Predictor (X)	Mediator (M1)	Mediator (M2)	Outcome (Y)	95% CI
Achievement Striving	PP Support	BPN Relatedness	Positive Mental Health	**[.01, .13]**
APS-R Personal Standards	PP Support	BPN Relatedness	Positive Mental Health	**[.05, .16]**
APS-R Discrepancies	PP Support	BPN Relatedness	Positive Mental Health	**[-.14, -.02]**
Achievement Striving	PP Support	BPN Relatedness	Zest for Life	[.004, .09]
APS-R Personal Standards	PP Support	BPN Relatedness	Zest for Life	[.03, .11]
APS-R Discrepancies	PP Support	BPN Relatedness	Zest for Life	[-.11, .00]
Achievement Striving	PP Support	BPN Relatedness	Life Purpose	[.008, .09]
APS-R Personal Standards	PP Support	BPN Relatedness	Life Purpose	**[.02, .11]**
APS-R Discrepancies	PP Support	BPN Relatedness	Life Purpose	[-.11, .00]
Achievement Striving	PP Support	BPN Relatedness	Passion	[.001, .06]
APS-R Personal Standards	PP Support	BPN Relatedness	Passion	**[.01, .08]**
APS-R Discrepancies	PP Support	BPN Relatedness	Passion	[-.10, .00]

Note. Confidence intervals (CI) were derived using a Monte Carlo method with 5,000 resamples using standardized coefficients.

PP = Personal Projects; BPN = BPN; APS-R = Almost Perfect Scale – Revised

Chapter 5

What Makes a Personal Project Enjoyable?

Characterizing the 'Positive' of Positive Activities

In Chapter 3, I moved beyond just eudaimonic and hedonic well-being, by also measuring passion and zest for life. I found that achievement strivers experienced well-being by meeting the basic psychological need of competence at the global and activity level, regardless of the type of well-being. In addition to competence, those with higher personal standards experienced well-being (all types) through all three basic psychological needs (relatedness and autonomy) at the psychological and activity level, whereas achievement strivers only felt happier when they felt competent. This may be due to the individual nature of personal standards (expectations for own performance; Slaney et al., 2001), relative to achievement strivers' high expectations for their performance as well as others' (Costa et al., 1991). Experiences of eudaimonia (purpose in life) and hedonia (emotional well-being) were once again strongly positively correlated. By using measuring multiple achievement-related personality traits and dimensions of well-being, I showed that pursuing core life projects in a personality-congruent way makes it more likely to meet basic psychological needs, thereby boosting well-being.

While I learned that people tend to pursue overarching core projects in their life in accordance with their personality, the specific nature of the projects were still unclear. In other words, I still wanted to identify what types of goals are pursued through people's core life projects. Books have been written on the value of personal projects for understanding a person, the 'doings' of their daily lives, and how their life is going (Little, 2014; 2017). As Little (2017) has said, our "deeds speaker louder than our dispositions" (p. 46). Exploring the types of projects people pursue

and what characterizes the enjoyment of these projects is of particular relevance to activity-based positive psychology intervention research. For example, the PAM was developed from the SHM (Lyubomirsky et al., 2005) and describes how, when, why, and for whom positive activities boost well-being (Layous & Lyubomirsky, 2014; Lyubomirsky & Layous, 2013). Moving beyond the question of whether activities can boost well-being (answered by the SHM), the PAM identifies the features of which activities that are responsible for boosting well-being.

Indeed, we can describe characteristics of an activity that make it a 'positive activity' at both the activity level (e.g., frequency and variety) and the person level (e.g., one's effort, motives, or beliefs). Additionally, I can differentiate between activity types and assess which types of activities are most enjoyed. As personal projects are embedded in everyday life, identifying the qualities that are associated with enjoyment can be beneficial in terms of finding ways to improve well-being, such as through positive activity interventions. Everyday activities embedded within core life projects are a primary avenue to improving well-being, as they are malleable (easily engaged in or disengaged in) and exist for everyone yet are generally congruent with specific personalities (idiosyncratic). Thus, personal projects are a potentially powerful avenue for positive activity interventions.

By building on the Chapter 3 findings that showed a consistent pathway from personality to projects, I next explore the different types of personal projects that people engage in and the types and activity features that predict enjoyment.

Chapter 6

It's the Little Things in Life: Enjoyment of Different Types of Personal Projects

The data used in this study were collected for the study presented in Chapter 4; this manuscript was adapted in part from results presented in Emma C. Coughlan's undergraduate honours thesis at Dalhousie University. Taylor Hill and her dissertation supervisor (Dr Sean P. Mackinnon) co-supervised Emma, and she supported the literature review for this manuscript. Taylor Hill completed all statistical analysis and wrote the first full draft of this manuscript. She received feedback on the analytic approach and editorial comments from the study's senior co-author (i.e., Taylor's dissertation supervisor, Dr Sean P. Mackinnon). This manuscript was accepted to the journal *International Journal of Applied Positive Psychology* in May 2024. This version of the article has been accepted for publication, after peer review and is subject to Springer Nature's Accepted Manuscript terms of use, but is not the Version of Record and does not reflect post-acceptance improvements, or any corrections.

It's the Little Things in Life: Enjoyment of Different Types of Personal Projects

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Abstract

Many positive psychology interventions aim to improve happiness through engagement in simple and intentional everyday activities that offer intrinsic rewards. Personal projects are personally relevant goal-directed activities that take place over an extended period of time, and are a way to study the intentional pursuit of happiness. This exploratory study identifies the types of projects that people engage in, and which project dimensions predict hedonic well-being (enjoyment). A sample (N = 327) of students and community participants completed the Personal Project Analysis in a cross-sectional survey. Two coders thematically coded projects into seven types. We used linear mixed models to identify which project types and dimensions uniquely predict enjoyment. People engaged in various types of activities (7 project types) which were enjoyed to different extents (relationship projects were most enjoyable while household maintenance were least enjoyable) and tend to experience greater enjoyment when projects encourage autonomy, control, likelihood of success, progress, absorption, low difficulty, and low challenge. Knowledge on which activity characteristics are linked to well-being can inform tailored positive psychology programming. Overall, people tend to find activities which are relatively easy and where they make a lot of progress more enjoyable, indicating simple daily activities are one way to intentionally prioritize daily well-being.

Keywords: well-being, personal projects, Self-Determination Theory, positive activities model

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People report thinking about happiness at least once every day (Freedman, 1978). Happiness generally refers to subjective well-being (the experience of frequent positive emotions relative to negative emotions, coupled with high life satisfaction) (Diener, 1984). In addition to simply being enjoyable, happiness holds additional value because of the secondhand effects which benefit individuals, families, and communities (Fredrickson, 2001; Lyubomirsky, King, et al., 2005). For example, happiness is predictive of and correlated with positive outcomes across multiple life domains, such as work, relationships, and physical health (Lyubomirsky, King, et al., 2005; Sheldon & Bettencourt, 2002). Happier people tend to report more stable relationships, stronger immune systems, greater income, and higher creativity than unhappier people, be more grateful, think optimistically, and engage in prosocial behaviour (Lyubomirsky, 2001), use media less (Kaliterna-Lipovčan & Prizmić-Larsen, 2016; Schiffer & Roberts, 2017), engage in community work, attend church often, and socialize with their family (Robinson & Martin, 2008; Schiffer & Roberts, 2017). Further, positive emotions have also been shown to prompt greater creativity and prosocial behaviour (Lyubomirsky et al., 2005; Fredrickson, 2001). In summary, happiness is more than feeling good, but it also is doing good. Being happy is good for the individual, and for one's social network and broader community.

Lyubomirsky's research program has provided experimental, longitudinal, and cross-sectional evidence that happiness is not just a correlate or consequence of positive outcomes but may be a cause of it (Lyubomirsky, King, et al., 2005). Considering the majority of people around the globe who report wanting to be happy (Diener, 2000), happiness researchers want to know if happiness can be achieved intentionally. Reassuringly, some researchers have theorized that much of people's happiness is under their control (Lyubomirsky, Sheldon, et al., 2005). For example, a major application of happiness research is to inform interventions that aim to increase levels of happiness

through engagement in certain activities (Lyubomirsky et al., 2005). The idea is that people can engage in simple, intentional, and regular practices which will entail mirroring the healthy thoughts and behaviours associated with naturally happy people, and these activities may boost happiness when deliberately practiced. Empirical evidence shows that when people were prompted to engage in positive intentional activities, such as thinking gratefully, optimistically, or mindfully, they also reported significantly higher levels of happiness (Sin & Lyubomirsky, 2009). Thus, people appear to be quite capable of engaging in multiple activities that they devote a great deal of time and energy towards, enjoy, and find meaningful (Vallerand, 2016). Identifying the types of activities people engage in and enjoy may inform interventions aiming to increase levels of happiness (Lyubomirsky et al., 2005). Some researchers theorize that for an activity to be genuinely enjoyed, the activity requires dimensions of interest, flow experiences, and feelings of personal expressiveness (Csikszentmihalyi, 1990; Deci & Ryan, 1985b; Waterman & Schwartz, 2013). The purpose of this study is to identify which dimensions contribute most to hedonic enjoyment.

Frameworks: Sustainable Happiness Model and Positive Activity Model

Succinctly, Lyubomirsky et al. (2005)'s model of happiness proposes three determinants of happiness: genetics, life circumstances, and intentional activities. The SMH argues that intentional activity is the most promising avenue for increasing one's happiness. Intentional activity is a broad category that includes the wide variety of things that people do and think in their daily lives, and specifically, actions or practices in which people can choose to engage and that require some degree of effort to enact. Some types of behavioral activity, such as exercising regularly or trying to be kind to others, are associated with well-being (Hill, Coughlan, et al., 2023), as well as some types of cognitive activity, such as savouring (Bryant, 2003) or pausing to count one's blessings (Emmons & McCullough, 2003) and some kinds of volitional activity, such as striving for personally valuable goals (Sheldon & Houser-Marko, 2001). Sin & Lyubomirsky (2009) compiled randomized controlled

trial results to show that engaging in positive activities with effort and purpose can reliably improve happiness, with average effect sizes of $r = .29$ for increasing well-being and $r = .31$ for decreasing ill-being.

More recently, researchers have begun unpacking the complexity of positive activities. Rather than exploring *if* activities can increase happiness, research has shifted to asking how, when, why, and for whom this can happen (Sheldon & Lyubomirsky, 2021). The Positive Activity Model (PAM) (Layous & Lyubomirsky, 2014; Lyubomirsky & Layous, 2013) identifies which positive practices are more (or less) effective in increasing happiness. Essentially, the PAM identifies three ways that happiness can be boosted: activity characteristics (e.g., the frequency of the behaviour or level of novelty/variety), person characteristics (e.g., how much effort is put in to pursuing the activity, how motivated the person is to become happier, and if the person believes the activity will work), and the interaction between the two (i.e., degree to which the activity complements one's personality traits or values). The PAM also suggests mechanisms underlying the happiness boost, such as satisfying basic psychological needs. The idea that activities boost happiness by satisfying psychological needs (i.e. autonomy, competence, and relatedness) (Ryan & Deci, 2000) is not new. Research on the mediating role of need satisfaction and person-activity fit is robust; recently, Hill et al. (2023) found that when activities are particularly suited to one's personality, the boost in well-being can be explained by need satisfaction, such as achievement strivers' pursuing competence-enhancement activities which satisfy their basic psychological need for competence, and increase well-being. While the SHM suggests that the pursuit of happiness is possible through engagement in positive activities, the PAM highlights the specific conditions under which this pursuit will be most effective.

Understandably, much of the research on positive activities and well-being have been on experimentally introducing new behaviours and testing whether theoretical premises hold. However,

another way to gain insight into the things people do is to ask them open-ended questions about their current core life projects. Similarly, this work is quite specific to short-term activities, so focusing on more long-term activities is an area for growth in the literature. Personal projects refer to goal-directed activities that are personally relevant and that take place over an extended period (Little, 1983). These enduring activities range from daily routine tasks to important commitments and aspirations; they fall somewhere between people's routine on a Tuesday morning and grander life pursuits. Personal projects promote well-being when they are meaningful, manageable, not overly stressful, and supported by others (Little, 1989). As personal projects are temporally extended, personally salient, action-oriented, and contextual (Little & Coulombe, 2015), they provide an interesting avenue to apply the premises of both the SHM and the PAM which have traditionally focused on instructing the enactment of new behaviours rather than applying these models to pre-existing behavioral repertoire.

Beyond Activities: Personal Projects

Aspects of personal projects can be assessed through the Personal Project Analysis (Little, 1989). The Personal Project Analysis is composed of two components: 1) project elicitation and 2) project rating matrix (Little, 1989). Essentially, the project elicitation simply asks participants to list what their personal projects are in an open-ended way. Examples of personal projects are losing weight, be a better person, and be more diligent with schoolwork (Little & Gee, 2007). The next component, the project rating matrix, is considered as the core component. This component is concerned with how each project is going (Little & Gee, 2007). There are two components in this section: a cognitive matrix and an affective matrix. Most relevant to the present study is the cognitive matrix which covers five theoretical factors: meaning (i.e., self-identity and value congruency), structure (i.e., control and time adequacy), community (i.e., visibility, other's view of importance of the project, and support), efficacy (i.e., progress and anticipated successful outcome),

and stress (i.e., stress, challenge, and difficulty). These five factors represent major areas of psychology, and their dimensions can be used as a proxy of the project's effective pursuit as well as the pursuers' quality of life and flourishing.

Early examinations of personal projects identified major influences shaping effective project pursuit, such as meaning, structure, community, efficacy, and stress (Little, 1989, 1998). Specifically, project meaning is measured through dimensions of self-identity and value congruency; structure is measured by control and time adequacy dimensions; community is measured through visibility, support, and others' view of project importance; efficacy is measured through progress, competence, and anticipated successful outcome; and stress is measured with challenge and difficulty. Little (1999) then showed that having projects relatively high on meaning, structure, community, and efficacy (but low in stress), are related to well-being. Past studies emerging from his research program has linked project enjoyment to time adequacy, value, likelihood of success, absorption, progress (Blunt & Pychyl, 2000; Christiansen, 2000) and negatively linked to project difficulty (Christiansen, 2000). Taken together, the literature on personal projects highlights the varied dimensions in which projects are experienced and how they are enjoyed. However, the qualities of certain activities may be particularly important for enjoying that activity; it remains unclear which project characteristics provide a sense of enjoyment. Moreover, relevant literature on project enjoyment has largely been stagnant in the past two decades (Blunt & Pychyl, 2000), Considering the ways in which everyday life changes over time, there is room for refreshing knowledge on the activities that people engage in and what it means for their well-being.

Rationale and Research Questions

Given that much of the research on positive activities and well-being have been on experimentally introducing new short-term behaviours and testing whether theoretical premises hold, a gap exists to apply the premises of both the SHM and the PAM to longer-term personal

projects. This project aims to identify what types of personal projects individuals engage in, and then to assess the project dimensions that contribute to project enjoyment (hedonic well-being). As personal projects are embedded in everyday life, identifying the qualities that are associated with enjoyment can be beneficial in terms of finding ways to improve well-being. The findings of this study will update the literature on the types of projects people engage in, which personal project types are most enjoyable, and which project characteristics contribute to enjoyment across the project types. Everyday activities are a primary avenue to improving well-being, as they are malleable (easily engaged in or disengaged in) and exist for everyone yet are generally congruent with specific personalities (idiosyncratic). Our exploratory research questions are as follows:

Research Question 1: What is the nature of the personal projects that people engage in and how enjoyable are they?

Research Question 2: Which personal project dimensions uniquely predict project enjoyment (i.e., hedonic happiness when engaging in the project)?

Method

Sample Size Justification

Analyses in this paper are secondary analyses on archival data collected for Hill et al. (2023). The final sample size of 327 was originally based on a precision power analysis, powered to detect correlations of $r = .21$ with a 95% confidence interval width of $\pm .10$. Unlike the original study, the present study used repeated measures correlations and linear mixed models (i.e., ratings for 3 personal projects per participant). Power for repeated measures correlations can be calculated in a similar fashion to non-nested data, but instead substituting degrees of freedom using the formula N(k-1)-1 or (327(3-1)-1) = 653 in the present case (Bakdash & Marusich, 2017). Thus, using a sensitivity power analysis in GPower software (Erdfelder et al., 1996), assuming 95% power and an

alpha of 0.05 we have sufficient power to detect repeated measures correlations of $r = 0.14$ or higher.

Participants

About two-thirds of the sample were undergraduate psychology students at a large Atlantic Canadian university ($N = 214$) and one-third were adults from an Atlantic Canadian community sample ($N = 113$). Given our interest in how activity type predicts well-being regardless of personality-specific processes, the two samples were merged into a single dataset.[5] The participants' age ranged between 17 and 72, with an average age of 24.95 ($SD = 10.49$). Participants were mostly women (81.04%), with some men (17.43%) and non-binary participants (1.22%). Further demographic statistics are reported in Hill et al. (2023) or can be calculated from the raw data on our OSF page [https://osf.io/g324p/?view_only=4b24c3bbcd49401db82dfb04c6c2f569].

Open Materials and Data

Our OSF page includes copies of all materials and measures used in this study, including measures not examined in the present paper, as well as all data and syntax (https://osf.io/g324p/?view_only=4b24c3bbcd49401db82dfb04c6c2f569).

Personal Project Analysis

The Personal Project Analysis (Little & Coulombe, 2015) measures pursual and perceptions of personal projects, through project elicitation (identification their personal projects with an open-ended text field) and project rating (perceptions of project dimensions). The present study elicited up to three personal projects that participants deemed most important with regards to their everyday life. In keeping with the original Personal Project Analysis workbook (PPA; Little, 1983),

[5] This dataset was collected for Study 2 (Chapter 4) and showed weak, positive correlations between being a student (i.e., younger) and personality, and no relationship to basic psychological need satisfaction or well-being.

participants then provided ratings on a 10-point unipolar scale on the following dimensions: importance, difficulty, visibility, control, responsibility, time adequacy, likelihood of success, others' view of importance, progress, value congruence, challenge, absorption, support, competence, autonomy, and enjoyment (the outcome variable). The PPA has shown moderate test-retest reliability Little & Coulombe, 2015). Finally, project dimensions tend to positively correlate with well-being measures, which demonstrates criterion validity (Little, 2011).

Procedure

The research was approved by the institutional ethics board (Dalhousie University; #2020-5376). The SONA system (institutional online platform housing the undergraduate student participant pool) was used to recruit the undergraduate psychology students from January to April of 2021; 0.5 bonus points were granted to an applicable course for their participation. We used flyers and online advertisements to recruit participants from the community between January 2021 and February 2022, in exchange for the change to win a $50 gift card. The undergraduate psychology students who registered for this study via the SONA system were required to log onto the SONA platform using their university account, where they were given a link to the survey. The survey was administered through SurveyMonkey, a paid online survey platform. Participants needed access to the internet and to an electronic device (i.e., computer, mobile phone, or tablet) to complete the survey. Participants from the general population either a) saw a flyer in the community and emailed the principal investigator for the survey link, or b) saw an advertisement online with a direct link to the survey. The questionnaire took about 25 minutes to complete. At the end of the questionnaire, a link was provided to enter an email address for the $50 gift card draw.

Content Coding. The personal projects were first thematically categorized into seven project types, based on: a) common types identified in the personal project literature (Hill, Coughlan, et al., 2023; Karoly & Lecci, 1993) and b) a pilot coding of project types on 100 participant's first

personal project listed. First, two coders (TGH and ECC) independently reviewed the listed projects and drafted a list of possible project types. After a comparison and discussion of the potential project categories, the coders both independently coded the first listed 100 projects into the categories. Then, the categories were discussed again, and some refinements were made (for example, two previously separate categories were combined because they were similar enough that many projects tended to fit in both). After the final seven categories were finalized, the two coders categorized the remaining projects. Discrepancies were resolved through discussion to arrive at a final categorization for each project. Inter-rater reliability was measured with AC_1 (Gwet, 2002).

Quantitative. Data were analyzed using R (version 4.2.2). The personal project data were organized in long format, with three rows for each participant (i.e., one for each of the three personal projects). We used the function *rmcorr_mat* in the package *rmcorr* (Bakdash & Marusich, 2017) for repeated measures correlations and adjusted *p*-values for multiple comparisons using a sequential Holm-Bonferroni correction (Holm, 1979) to adjust for familywise error rates. Linear mixed models (LMMs) allow us to account for the correlation between repeated measures within the same participant (who rated three projects). We used LMMs with random intercepts and fixed slopes in the *R* package *lmer* to assess project enjoyment (i.e., hedonic happiness related to the project) by project type, using the *lme4* package (Bates et al., 2015). The first model specification was: enjoyment ~ type + (1|id). We included participant id as a random effect and project type as a fixed effect. This model is analogous to a one-way ANOVA, and thus we report the omnibus χ^2 test-statistic as well as post-hoc tests using a Holm-Bonferroni correction. In the second analysis, we used project dimension ratings as a fixed effects as a second LMM. This second model is essentially a multiple regression model with random intercepts and fixed slopes. Overall R^2 values were calculated in both models using marginal R^2 (i.e., fixed effects only) and conditional R^2 (i.e., both fixed and random effects; (Nakagawa & Schielzeth, 2013).

Results

Content Coding and Descriptive Statistics

The personal projects were categorized in either one of seven types (Table 6.1).[6] The most common types of personal projects fell in the occupation category (32.65%) followed by the relationship, physical health, hobbies/leisure, mental/spiritual/ emotional health, learning/skills, with the least common category being household/life planning projects (4.79%). When raters compared their ratings, inter-rater reliability was generally high for the first (AC_1 = 0.91), second (AC_1 = 0.88), and third (AC_1 = 0.87) personal project. There were some missing data for the open-ended response for the first (n = 27), second (n = 29), and third (n = 32) personal project. Table 6.2 shows descriptive statistics on personal project dimensions.

Project Enjoyment by Type

The overall omnibus test suggested that there was a difference in enjoyment across the 7 project types, $\chi^2(6) = 49.11$, $p < .001$, marginal $R^2 = 0.044$, conditional $R^2 = 0.363$. Results were further probed with post-hoc tests. Means, standard deviations, 95% confidence intervals, and statistically significant post-hoc tests are depicted in Table 6.2 and Figure 6.2. Overall, 7 of 21 post-hoc tests were statistically significant after adjusting for familywise error. Hobbies and leisure projects were rated significantly higher in enjoyment than household and life planning projects ($M_{difference}$ = 1.66, 95% CI [0.29, 3.03]) and occupational projects ($M_{difference}$ = 1.00, 95% CI [0.10, 1.88]). Additionally, household and life planning projects were less enjoyable than learning and skill development projects ($M_{difference}$ = 1.84, 95% CI [-3.38, -0.29]) and relationship projects ($M_{difference}$ = -2.01, 95% CI [-3.31, -0.72]). Learning and skill development projects were more enjoyable than

[6] Coders categorized the activities into thematic groups; each activity was forced into a category.

occupational projects ($M_{difference}$ = 1.17, 95% CI [0.03, 2.31]), although both physical health and fitness projects ($M_{difference}$ = 1.07, 95% CI [-2.00, -0.14]) and occupational projects ($M_{difference}$ = -1.35, 95% CI [-2.10, -0.59]) were less enjoyable than relationship projects. Overall, household and life planning projects tended to be the least enjoyable and relationship projects were the most enjoyable.

Repeated Measures Correlations

Nearly all of the project dimensions were positively correlated with one another, except that enjoyment was moderately negatively correlated with difficulty (r = -.29) and weakly negatively correlated with challenge (r = -.17), and difficulty was also weakly negatively correlated with control (r = -.11), all significant at $p < .05$ with Holm-Bonferroni correction (Figure 6.1). Enjoyment was positively and moderately correlated with competence, autonomy, control, likelihood of a successful likelihood of success, progress, and absorption (rs ranging from .31 to .37, all significant at $p_{holm} < .05$). The dimensions that enjoyment was not significantly correlated with were support and others' view of importance. The strongest positive correlations ($r > .50$) were between likelihood of a successful outcome and competence, difficulty and challenge, support and others' view of importance, progress and competence, and importance and visibility (rs ranging from .51 to .62).

Multiple Regression

In the second LMM, all variables (both outcomes and predictors) are conveniently scaled on a 10pt scale; thus, the unstandardized coefficients have a straightforward interpretation, and their magnitude can be compared to each other. For instance, the coefficient for project dimensions of autonomy was b = 0.20, 95% CI [.12, .28]. This means that a one-point increase on a 10pt scale for autonomy was associated with a 0.2pt increase in the 10pt scale of enjoyment, after controlling for all other predictors in the model. However, the confidence interval suggests that this slope could be anywhere from 0.12 to 0.28 in the population. Other statistically significant positive relationships

included control (b = 0.10, 95% CI [.01, .18]), likelihood of success (b = 0.16, 95% CI [.05, .26]), progress (b = 0.08, 95% CI [.00, .15]), and absorption (b = 0.18, 95% CI [.10, .26]). Project difficulty (b = -0.20, 95% CI [-.27, -.12]) and challenge (b = -0.14, 95% CI [-.22, -.06]) were associated with less enjoyment. Overall, all 14 predictors in the model explained about 36% of the variance in enjoyment (marginal R^2) or about 55% of the variance if random effects are also considered (conditional R^2).

Discussion

The purpose of this paper was to identify the types of projects people pursue and explore which project characteristics explain unique variation in enjoyment (i.e., hedonic well-being). People engaged in various types of activities which are enjoyed to different extents (relationship projects were most enjoyable and household projects least enjoyable) and participants tended to experience greater enjoyment when projects encourage autonomy, control, likelihood of success, progress, absorption, low difficulty, and low challenge. Knowledge on which activity characteristics are linked to well-being can extend the SHM (Lyubomirsky et al., 2005) and enable tailored positive psychology programming.

Personal Projects Vary in Type and Enjoyment

The nature of personal projects varied in type, supporting previous research showing people can engage with and be passionate about in multiple activities (Vallerand 2015). The most commonly reported project type was occupation-related, such as getting a degree, pursuing specialized routes such as undergraduate thesis research, and pursuing experiences that build their resume. People also pursued social connections (e.g., spending more time with friends and family), hobbies and leisure (e.g., vlogging), household improvement (e.g., renovating or remodeling), skill development (e.g., learning an instrument or new language), self-care activities (e.g., relaxing, meditation), and fitness

(e.g., attending the gym more often). These projects are similar to the positive activities reported in the literature which include pursuing valued goals, engaging in physical exercise, and nurturing social relationships (Parks et al., 2012), but slightly more diverse, in that we capture activities related to ordinary, everyday pursuits (e.g., maintaining or improving one's home) and to eudaimonic motives (e.g., learning new skills and broadening one's horizons).

Compared to hobbies and leisure projects, household projects and occupational projects were less enjoyable, while relationship projects were more enjoyable. As these data were collected during a local lockdown period in the global pandemic, people may have been disproportionately allocating time and energy into household and occupational projects, as well as experiencing a forced reduction in social time. During this time, the daily rhythms and previously separated spheres of life (e.g., work and play) became blurred. A possible repercussion is that diminished autonomy in everyday life and (e.g., shift in routines such as working from home) lowers well-being because the basic psychological need for autonomy is thwarted. The experience of autonomy thwarting can make one more prone to anxiety (Patall et al., 2017) and reduce well-being (Ryan & Deci, 2017); autonomy thwarting has recently been coined the 'dark side' of autonomy (Johansen et al., 2023). On the other hand, people may cognitively reframe and positively reappraise the situation as a coping mechanism (Folkman & Moskowitz, 2000). Adjusting to a difficult situation by focusing on the positive aspects (i.e., positive reappraisal) and engaging in other activities has been identified as a means to buffer pandemic-related threads to well-being (Kim et al., 2022). For example, studies has shown that people reported enjoying more time for home-based leisure activities, like playing board games, engaging in arts and crafts, and bike riding (Hood et al., 2021), and others experienced a positive change in well-being associated with feeling close and connected to their family (Hill, McIsaac, et al., 2023). While feelings of autonomy may have decreased during the pandemic, it seems that reframing the situation to find strengths and silver linings may helped with maintaining

well-being. To that end, our participants may have reported strongly enjoying relationship projects even if they were virtual connections (e.g., video conferencing family members), because the opportunity for in-person social connection was reduced or non-existent. Re-allocating and re-investing oneself into home and work may have been a useful distraction tool to maintain well-being (Kim et al., 2022).

Characteristics of Enjoyable Projects

The project dimensions that contribute to greater enjoyment were autonomy, control, likelihood of success, progress, absorption, low difficulty, and low challenge, which support and extend earlier findings. Positive psychologists have argued that, beyond what people do (work, study, play, rest), the key to well-being may be experiencing higher autonomy without necessarily eliminating extrinsic motivation (Kukita et al., 2014). Activities that are freely chosen and personally valued can facilitate autonomy which increases well-being, whereas activities that are not freely chosen retract from positive moods (Reis et al., 2000). Using a daily diary study on self-chosen activities and well-being, Reis et al. (2000) showed that higher levels of daily autonomy predicted increases in positive affect and decreases in negative affect. The level of autonomy in activities may be more important for daily positive affect than are the specific categories of activity one engages in (Weinstein & Mermelstein, 2007). That is, beyond what people do (work, study, play, rest), the key to well-being may be experiencing higher autonomy without necessarily eliminating extrinsic motivation (Kukita et al., 2014), as perceived choice and opportunity are positively correlation with life satisfaction (Steckermeier, 2021).

We also found that projects were rated less enjoyable when they are considered difficult or challenging with a low likelihood of success and little progress, which previously been reported (Christiansen, 2000). The association of challenge and difficulty with lower enjoyment is novel in the personal project literature; there may be a curvilinear relationship for challenge and difficulty with

enjoyment that we were unable to capture in cross-sectional data,[7] where a "right amount" of challenge or difficulty can help propel and motivate people, but too much challenge or a project that is too difficult can cause procrastination or avoidance. Similarly, believing that one is likely to progress in their project to the point of likely successful completion is an important dimension of choosing mood-boosting activities (Waterman, 2005). While both moderately high, personal projects were rated, on average, less difficult than challenging. While challenge ratings were lower on average, visualizing the relationship suggests the association of project challenge with enjoyment is slightly stronger than with project difficulty (see Figures A1-2 in Appendix B for scatterplots). Recently, the positive psychology of challenge has been proposed (Horikoshi, 2022), which highlights the role of challenge in its' balance with skills in flow (Nakamura & Csikszentmihalyi, 2009), intrinsic motivation (Ryan & Deci, 2000), curiosity (Kashdan & Silvia, 2009), and character strengths (Park et al., 2004). Challenge may be more closely aligned with activities that contribute to eudaimonic well-being rather than hedonic happiness; too much challenge, and the enjoyment of the project is threatened, but the fulfillment following completion (eudaimonic in nature) may be even stronger. Too little challenge, and the project may be unengaging (and low in hedonic enjoyment) and unfulfilling (unlikely to contribute to eudaimonic well-being). In comparison to hedonic enjoyment, levels of eudaimonic well-being (operationalized as feelings of personal expressiveness) have been more strongly associated with feeling competent, concentrated, and challenged, and investing more effort into the task at hand (Waterman, 2005). Thus, challenge may be an important contributor to enjoying projects associated with eudaimonic motives, and less suited to projects pursued for relaxation (such as hobbies and leisure).

[7] A test of the curvilinear relationship between challenge/difficulty and project enjoyment was conducted as supplementary analyses upon request from my external examiner and thus is not reflected in the published manuscript. This estimates a univariate regression-style LMM with the original variable of challenge and difficulty as well as their squared values as additional predictors (1 model for challenge and 1 model for difficulty). The quadratic variables were both significant, indicating that a curvilinear relationship does exist. These analyses presented in Table A1 and Figures A1-2 (Appendix B).

Absorption: A New Avenue for Positive Activities?

Absorption (a key characteristic of flow) was linked to greater project enjoyment. Previously, researchers have theorized that for an activity to be genuinely enjoyed, one must have interest, experience flow, and feel personally expressive in that activity (Csikszentmihalyi, 1990 as cited in Noseworthy et al., 2021; Deci & Ryan, 1985b; Waterman & Schwartz, 2013). The association between absorption and enjoyment in the current study suggests that being in flow may be experienced more positively (i.e., feelings of positive emotions such as enjoyment) than originally thought. Flow research has predominantly been conducted on specific types of people who engage in creative or elite activities (such as musicians, artists, and athletes), with less known about how the general population experiences intense absorption in everyday life. The current results indicate that feelings of absorption are helpful for enjoying everyday life, such as honing one's craft, activities associated with household maintenance, and using leisure time for personal hobbies. As a contribution to theoretical understandings of positive activities, being intensely engaged in an activity may be a promising avenue for enjoying that activity.

Theoretical Contributions

Lyubomirsky et al. (2005)'s SHM argues that intentional activity is the most promising avenue for increasing one's happiness, such as personally expressive activities. Our analyses help uncover the specific characteristics that may contribute to the enjoyment of these activities, which can help bridge theory with practice, by informing positive psychology interventions based on Lyubomirsky's theories. People tend to show a coherent pattern of preferences for certain types of activities (e.g., activities that focus on savoring the present versus reflecting on the past (Schueller, 2010), suggesting that positive activities could be empirically categorized and used to predict which types will benefit which people. When people are asked to engage in an activity similar to one they

previously showed a preference for, they tend to experience greater boosts to well-being than those who engage in an activity they have not previously enjoyed (Dickerhoof, 2007; Schueller, 2010). As the hedonic adaptation model (Diener et al., 2009) argues, variety in positive activities can help slow the rate of adaptation (or regression back toward one's mean happiness level). Likely, the preference for previously enjoyed activities is balanced with some level of variety, which is a previously reported important feature of positive activities (Sheldon et al., 2013). By using pre-existing personal projects as the unit of analysis rather than assigning activities to participants, we provide an initial taxonomy of types of activities that can be used in future positive activities research that builds on individual preferences which is empirically more fruitful for increasing well-being. However, a critique of the SMH is the ambiguity of what it means to say that a person has achieved a stable (and potentially sustainable) change in well-being. At least three waves of data are required to demonstrate a stable change in well-being, in which a person's happiness level first goes up, and then stays up (Diener et al., 1999). Much of the support for the SMH is based on temporary boosts to happiness, with less focus on the 'sustainable' tenant. More recently, Sheldon and Lyubomirsky (2019) have responded to the critiques, reflecting that it may be more accurate to say that people's well-being is in a 'range of potential' rather than a 'set point,' acknowledging that any range has a central tendency. In fact, the more recent work from Lyubomirsky's research program has been on the adaption to the set point. That is, research is now examining how to prevent the potential regression back towards one's prior central tendency, perhaps in the long-term, as a function of one's life choices and behavioral activities (Sheldon & Lyubomirsky, 2021).

Limitations

A primary limitation to this study was in our ability to recruit representative participants from the general population. Due to the pandemic restrictions at the time of data collection, sampling methods for the general population were limited to posters and online advertisements to

avoid social contact. To obtain the target sample size, we also recruited participants from the university participant pool, which is relatively homogenous in terms of gender and ethnic background. As a result, our sample is comprised of mostly White women, which limits the degree to which our results apply to the general population. A second limitation of this study is in our measurement of personal projects. The original Personal Project Analysis is based on ten personal projects per participant. Because we thought this would be overly burdensome for participants, we only asked for three personal projects which required participants to prioritize projects that fell in major life domains such as education, work, and family. By reducing the number of personal projects, participants may have chosen more general projects over uniquely personal ones. Further, our finding that relationship projects were most enjoyable may be biased by the nature of life during data collection, which was characterized by a pandemic-related lockdown on all social contact. Participants may have been feeling the need for close social contact at the time of this survey, which could lead to an exaggerated sense of how enjoyable social connections tends to be.

Future Directions

As absorption was the strongest unique predictor of enjoyment of personal projects, examining which activities people tend to engage in when they enter a flow state and the associated boost in well-being would be insightful for building the evidence base of flow in the activities of everyday life. Outside of project dimensions, project enjoyment tends to correlate with positive mood. Specifically, those in a positive mood tend to rate projects as more enjoyable and less difficult (Meyer et al., 2004). Further, (Jackson et al., 2002) found that happy people view their idiosyncratic personal projects as more enjoyable and less difficult than those unsatisfied with life. Taken together, it is plausible that happy people tend to select their activities in a way that encourages flow (or are flow prone), rather than starting in a blank slate, engaging in an activity, and then

experiencing flow and well-being. The direction of the relationships among activities, flow, and well-being are difficult to disentangle but an interesting future direction. a

Conclusion

People engage in various types of activities which are enjoyed to different extents. People tended to enjoy relationship projects the most, and experience greater well-being when projects are autonomously chosen, are achievable enough to provide a sense of competence, allow for rapid progress, and are highly absorbing (i.e., elicit a flow state). Overall, these findings suggest that personal projects are a primary avenue to improving well-being and could inform efforts to promote positive mental health for the general population.

Table 6.1

Types of Personal Projects

Types of Personal Projects	Definition	Example	*N*
Occupational	One's occupation (i.e., work/school)	Getting my degree	334 (32.65%)
Relationship	Related to other people	Staying connected with friends	145 (14.17%)
Physical Health/Fitness	Health-promoting behaviours and/or healthy life choices	Losing weight	132 (12.90%)
Hobbies/Leisure	Pleasurable activities	Starting a YouTube channel	99 (9.68%)
Mental Health Promoting	Any mental health-promoting behaviours and/or spiritual behaviours	Regular meditation	70 (6.84%)
Skill Development	Learning new things and improving current skills	Learning to draw	64 (6.26%)
Household/Life Planning	Household projects or life projects	Retirement financial planning	49 (4.79%)

Table 6.2

Descriptive Statistics of Personal Project Dimensions

Variable	*M* (SD)
Support	6.92 (2.98)
Competence	7.63 (2.46)
Autonomy	8.22 (2.50)
Enjoyment	5.65 (2.91)
Importance	8.61 (2.20)
Difficulty	6.82 (2.64)
Visibility	7.71 (2.41)
Control	7.08 (2..59)
Responsibility	8.41 (2.33)
Likelihood of success	7.65 (2.38)
Others' view of importance	7.06 (2.99)
Congruence with values	8.10 (2.38)
Progress	6.59 (2.80)
Challenge	7.48 (2.59)
Absorption	7.21 (2.67)

Note. All dimension scores range from 0-10. Number of ratings per type vary from 898 to 903; 355 individual participants rated three projects.

Table 6.3

Enjoyment Level by Project Type

Project Type	*M* (SD)
Hobbies/Leisure	7.33 (2.77)
Household/Life Planning	5.25 (3.05)
Skill Development	7.41 (2.78)
Mental Health Promoting	6.43 (2.66)
Occupational	6.25 (2.67)
Physical Health	6.45 (3.05)
Relationships	7.61 (2.52)

Note. Enjoyment scores range from 0-10.

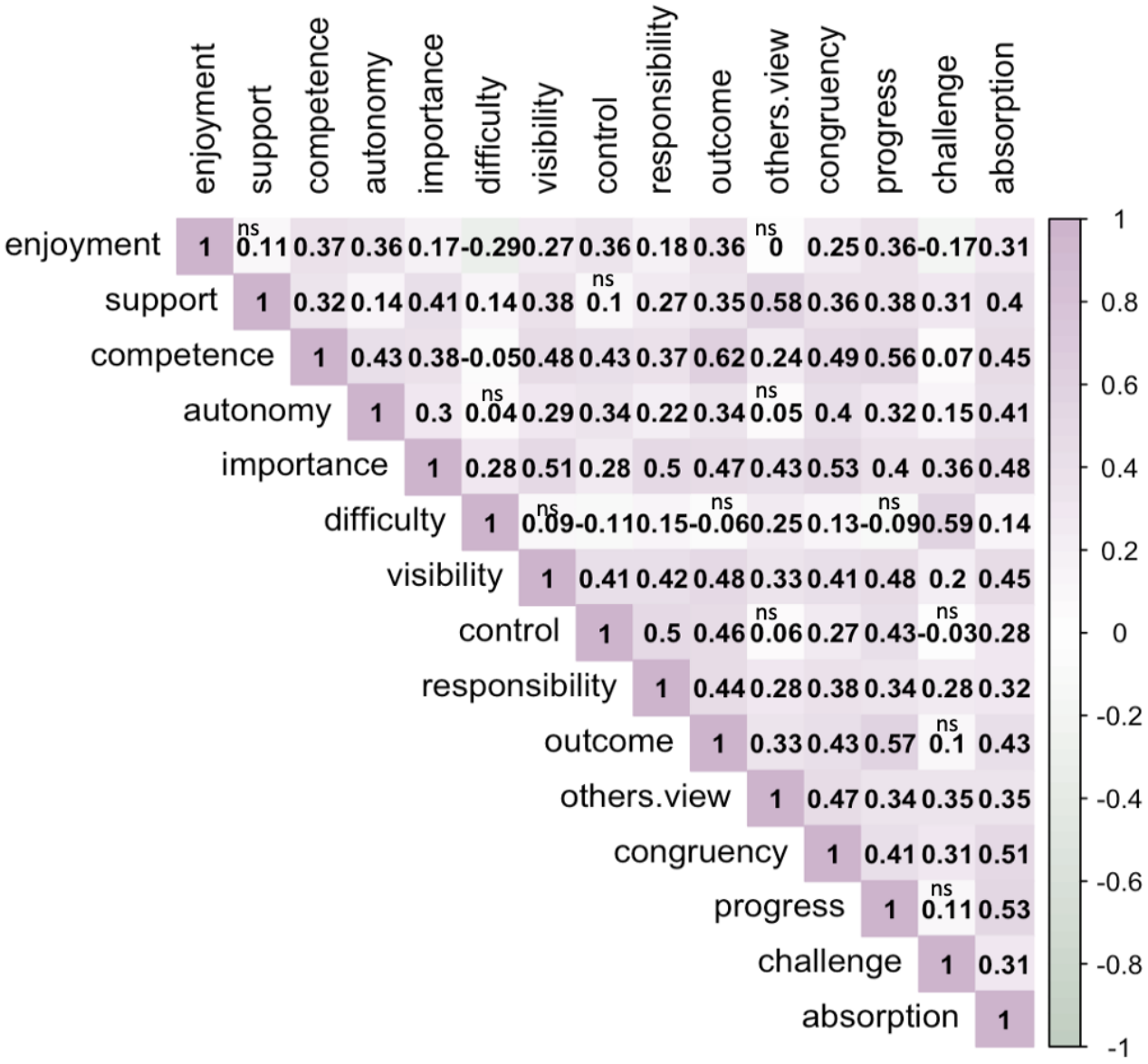
Table 6.4

Results of Linear Mixed Model Predicting Project Enjoyment from Project Type and Project Dimensions

Predictors	*Estimates*	*CI*	*p*
(Intercept)	1.90	1.13 – 2.67	**<0.001**
support	0.01	-0.06 – 0.08	0.728
competence	0.06	-0.04 – 0.16	0.224
autonomy	0.20	0.12 – 0.28	**<0.001**
importance	0.02	-0.09 – 0.13	0.666
difficulty	-0.20	-0.27 – -0.12	**<0.001**
visibility	0.08	-0.00 – 0.17	0.053
control	0.10	0.01 – 0.18	**0.021**
responsibility	0.01	-0.08 – 0.11	0.824
likelihood of success	0.16	0.05 – 0.26	**0.003**
others view	-0.03	-0.11 – 0.04	0.358
congruency	0.06	-0.04 – 0.15	0.248
progress	0.08	0.00 – 0.15	**0.046**
challenge	-0.14	-0.22 – -0.06	**0.001**
absorption	0.18	0.10 – 0.26	**<0.001**
Random Effects			
σ^2	3.74		
$\tau_{00\ id}$	1.54		
ICC	0.29		
N_{id}	303		
Observations	898		
Marginal R^2 / Conditional R^2		0.358 / 0.546	

Figure 6.1

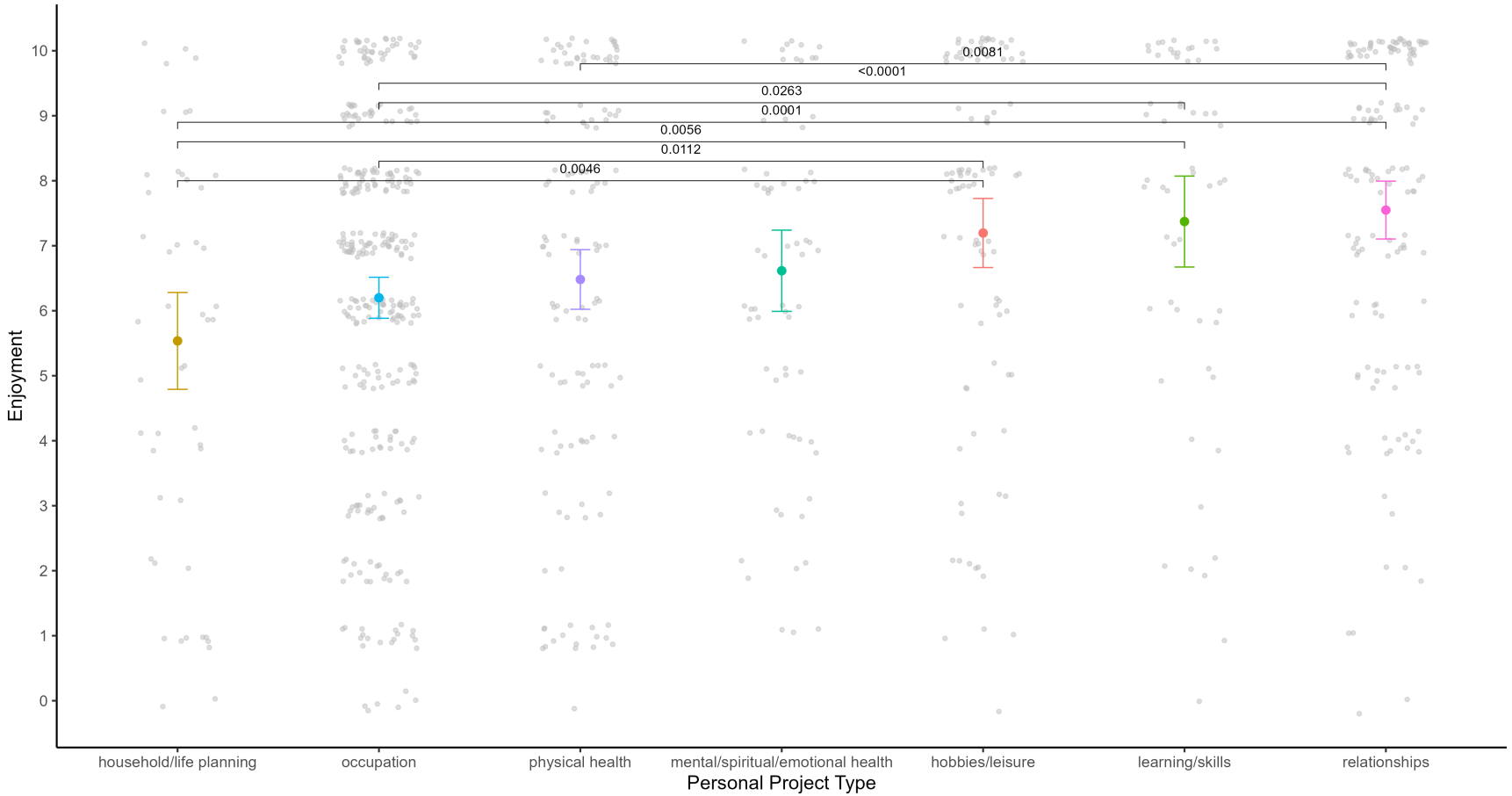
Repeated Measure Correlation Matrix, Adjusting for Each Participant Rating Three Projects on Each Dimension



Note. Purple represents positive correlations and green represent negative correlations. Correlations are significant at $p < .05$ (accounting for multiple comparisons using the Holm-Bonferroni correction), unless noted with 'ns.'

Figure 6.2

Estimated Marginal Means, 95% Confidence Intervals, Jittered Dot Plots, and Post-hoc Tests of Enjoyment Predicted by Project Type



Note. Numbers at the top of the plot indicate p-values after a Holm correction for statistically significant post-hoc tests.

Chapter 7

All Together Now:

Testing if Positive Activity Features Increase Achievement Strivers' Well-Being Over Time

In Chapter 6, I found that people tend to take part in seven different types of personal projects and that not all types of personal projects are equally enjoyed. More specifically, people engaged in various types of activities which were enjoyed to different extents (relationship-strengthening activities were most enjoyable and household projects least enjoyable). The positive psychology literature on activities suggest that intentional activity is the most promising avenue for increasing one's happiness (Lyubomirsky et al., 2005), and that features of people, activities, and the fit between the two are considered happiness-boosting conditions (Lyubomirsky & Layous, 2013). I elucidated the specific characteristics that may contribute to the enjoyment of activities, which helps clarify the activity features of positive activities. These characteristics were autonomy, control, likelihood of success, progress, absorption, low difficulty, and low challenge. This tells me that people enjoyed pursuing projects that can provide a sense of competence (i.e., controllable, not too difficult or challenging, high likelihood of success, current satisfactory progress) and are interesting (freely chosen and engaging). Indeed, the psychologist who coined the term 'personal project' has previous described well-being-boosting projects as manageable and not overly stressful (Little, 1989).

Of particular interest was the importance of absorption in enjoyment. Being fully engaged in an activity, to the degree of feeling utterly absorbed, is a defining characteristic of the optimal human experience described by Csikszentmihalyi (1990). In fact, Maslow (1968) described this experience early on when writing about peak human experiences of the self-actualized person. Thus, absorption helps make everyday life more interesting and engaging, particularly given that projects such as

honing one's craft, household maintenance, and spending leisure time on personal hobbies were commonly reported. Examining which activities people tend to engage in when they become absorbed (i.e., enter a flow state) would be insightful for building the evidence base of positive activities of everyday life.

The study described in Chapter 6 extended the scope of the positive activity literature by drawing on pre-existing behavioral repertoires (personal projects) as the unit of analysis rather than assigning activities to participants, which is common in positive psychology intervention research. Further, I provided an initial taxonomy of types of activities that can be used in future positive activities research that builds on individual preferences. However, a critique of the SHM and PAM is the ambiguity of what it means to say that a person has achieved a stable (and potentially sustainable) change in well-being. Detecting a stable, sustainable change in well-being requires more than one waves of data to truly show that a person's well-being has increased (Diener et al., 1999).

Much of the support for the SMH and PAM (including my study) measure hedonic happiness boosts, rather than more enduring, existential dimensions of well-being that are eudaimonic in nature. In previous chapters, I used cross-sectional models, which uses just one temporal measurement occasion. This rests on the assumption that the cause and effect occur within the time of data collection (and in the theorized way based on which variables were assigned as predictors vs. outcomes). As covariation does not necessarily imply causation, any causal inferences made from these models are weak because they fail to demonstrate temporal precedence. In order to fully test the premises of the SMH and PAM, a longitudinal study design is necessary.

In Chapter 8, I designed a study to incorporate all of the findings across my previous studies: people are happier when they feel they have adequate resources and a connection to others (Chapter 2), this is particularly true for high achieving people, as achievement strivers' feel happier when they engage in freely chosen activities that satisfy their basic psychological needs (Chapter 4) and are

highly engaging yet manageable (Chapter 6). In particular, I build on my Chapter 6 finding that activities are enjoyed when they provide a feeling of absorption, by testing if improvements in well-being persist over time after engaging in personally expressive activities that promote competence and flow.

Chapter 8

Focused, Flourishing, but not in Flow: Achievement Strivers' Experiences of Competence, Flow, and Well-Being During Personally Expressive Activities

Taylor Hill developed the research questions, was directly involved in the primary data collection for this study, and acquired an ethics review at Dalhousie University and York University. She and her dissertation supervisor (Dr Sean P. Mackinnon) co-supervised an undergraduate honours thesis student (Johanna V. Loock) who supported the literature review for this manuscript. Taylor completed all statistical analyses and writing of the first draft of this manuscript. She received feedback on the study design, analytic approach, and editorial comments from the study's senior co-author (i.e., Taylor's dissertation supervisor, Dr Sean P. Mackinnon) as well as research assistance in checking R code for accuracy and data visualization from Johanna V. Loock. This manuscript was accepted to the journal *International Journal of Applied Positive Psychology* in June 2024. This version of the article has been accepted for publication, after peer review and is subject to Springer Nature's Accepted Manuscript terms of use, but is not the Version of Record and does not reflect post-acceptance improvements, or any corrections.

Focused, Flourishing, but not in Flow: Achievement Strivers' Experiences of Competence, Flow, and Well-Being During Personally Expressive Activities

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Abstract

One effective route to increasing well-being is through the pursuit of activities which suit a person's personality strengths (i.e., person-activity fit). People who strive for achievement tend to organize their behaviours in ways that promote goal attainment and well-being. We tested the hypothesized process that achievement striving would lead to increased well-being over time through feelings of competence and flow. A secondary aim was to describe the types of personally valued activities and whether activity type facilitates competence and flow. Undergraduate students (N = 346 at Time 1; N = 244 at Time 2) completed an online survey measuring personality, personally expressive activities, basic psychological need satisfaction, flow, and well-being at two timepoints ~4 months apart. Two coders thematically coded activities into seven types (e.g., reading and writing, hobbies). We used cross-sectional and longitudinal serial mediation models to test our hypothesis with eudaimonic (life worth) and hedonic (life satisfaction) well-being, controlling for sample characteristics (recruitment source and term). Achievement striving was positively correlated to competence and well-being, but the indirect effects did not show that well-being is boosted by feeling competent and in flow during personally expressive activities, cross-sectionally or longitudinally. Perceived competence was comparable across activity types, although flow was highest in reading and writing activities. While achievement strivers tended to feel happy and competent at personally expressive activities, the mechanistic pathway to well-being is not yet clear. Future studies might recruit larger sample sizes and utilize smaller time lags (e.g., ecological momentary assessment).

Keywords: well-being, achievement striving, competence, flow, personally expressive activities

Focused, Flourishing, but not in Flow: Achievement Strivers' Experiences of Competence, Flow, and Well-Being During Personally Expressive Activities

Identifying the nature of personal goals offers a window into a person's life and helps us understand who they are. In McAdams' (1995) terms, personal goals are part of what we know when we know a person, at the level of characteristic adaptations (McAdams & Pals, 2006). The role of personal goals in human functioning and growth has been described as "the linchpin of psychological organization" (Klinger, 1998, p. 44). Goals infuse individual lives with a purpose for living, as they reflect a person's values, interests and priorities (Carver & Scheier, 2005). Whether studied as current concerns (Klinger, 1975, 1998), personal projects (Little, 1983), personally expressive activities (Waterman, 1993), personal strivings (Emmons, 1986), possible selves (Markus & Ruvolo, 1989), aspirations (Kasser & Ryan, 1993), or life tasks (Cantor & Sanderson, 1999), the literature is generally aligned in that goals contribute in varied ways to well-being (Carver & Scheier, 1998; Emmons & McCullough, 2003; Heckhausen et al., 2010, 2019; McAdams, 1995). We conceptualize personally expressive activities as the building blocks of pursuing personally meaningful goals, which are the foundation of eudaimonic well-being. Goal pursuit is consistently linked to well-being, such as a person's subjective evaluation of how life is going (Brunstein, 1993; Diener et al., 2002; Hill et al., 2023; Ryan & Deci, 2017) or enjoyment of the activities themselves (Waterman & Schwartz, 2013). In general, people prosper when they engage in valued activities that are inherently interesting and important to them (Waterman, 1993), and when activities are congruent with their personality strengths (Diener & Seligman, 2002), such as achievement striving (Hill et al., 2023). Some researchers suggest the most effective route to increasing one's long-term well-being is through the selection and pursuit of personally expressive activities (Emmons & McCullough, 2003; Waterman, 1993) which is by definition, shaped by the personality traits of a person. Indeed, people who strive for achievement tend to organize their behaviours in ways that

help them pursue goals and experience well-being at a single point in time, and feeling competent is one reason why achievement strivers tend to enjoy a sense of well-being (Hill et al., 2023). However, goal pursual is temporal in nature, requiring organization of one's efforts and actions over time to achieve an outcome. Thus, the purpose of this paper is to test the processes through which achievement striving leads to well-being.

Theoretical Framework: Self-Determination Theory

The meta-theory of personality and human motivation (SDT) contains six mini-theories that address facets of personality and human motivation. In particular, basic psychological need mini-theory proposes that every person has three innate psychological needs (autonomy, competence, and relatedness) which must be satisfied to experience optimal psychological health (Ryan & Deci, 2001). These needs are essential for psychological growth and wellness, are an inherent part of human functioning, and are universal (e.g., across culture, gender, and age; Ryan & Deci, 2001; Vansteenkiste et al., 2020). The satisfaction of these needs is necessary to enjoy positive psychological health, while thwarted needs may lead to negative outcomes such as psychological ill-being. SDT describes person-environment interactions which is the basis for theoretical predictions about people's motivation, personality, and behaviours. In other words, people experience social environments or contexts which can either support or thwart the fulfilment of the three needs (Legault, 2017). When people pursue activities that support the fulfilment of their BPNs, effective pursual (i.e., need satisfaction) is associated with positive life outcomes (Adams et al., 2017; Hill et al., 2023). For example, when people feel competent (i.e., use of one's skills and expertise while completing an activity), they may experience feelings of effectiveness and mastery. These social contexts are essentially need-relevant conditions that help facilitate improved well-being, such as activities that draw on one's personality strengths. Those whose' personality strengths involve having ambitious goals and the drive to pursue them are particularly inclined to experience well-

being boosts from feelings of competence. Recently, Hill et al. (2023) showed that personal projects can act as competence-supportive environments (which offer challenge and allow for skills and abilities to develop) which are important well-being boosters for those with achievement-oriented personality traits. Personally expressive activities may serve as a social environment that supports basic psychological need satisfaction and well-being. Moreover, with personality shaping the types of activities pursued and the likelihood of satisfying needs shaped by social contexts, there is a pathway from personality to activity pursual to psychological needs to well-being that is worth investigating.

Literature Review

Achievement Striving

Achievement striving is a personality trait that describes a disposition motivated to work hard and succeed (Drasgow et al., 2012). As a facet of conscientiousness, achievement striving entails setting high goals and having the drive to pursue and attain them (Dudley et al., 2006). Achievement-oriented individuals tend to engage in activities that promotes attainment of their ambitious goals (e.g., working hard to obtain a prestigious career). Making progress on personal goals elicits feelings of efficacy and achievement (Little et al., 1992), which is one reason why achievement strivers tend to experience higher well-being. Hill et al. (2023) proposed that satisfaction of the basic psychological need for competence may be so important to achievement strivers' happiness that the relationship will hold across many dimensions or types of well-being. Meta-analytic research has highlighted a moderately high correlation between achievement striving's broader factor conscientiousness and well-being (r = .36; Anglim et al., 2020).

Activities and Well-Being

Psychological research on well-being is divided by two traditions: hedonia (usually studied in terms of satisfaction and enjoyment of one's life) and eudaimonia (e.g., positive functioning,

including personal growth, authenticity, and meaning in life; Ryan & Deci 2001; Waterman, 1993). Hedonia and eudaimonia also influence how individuals generally orient their lives and motives for the activities they engage in (Huta & Waterman, 2014; Peterson et al., 2005). Assessing how and when eudaimonic and hedonic well-being differ is a primary theme in positive psychology research. Although conceptually distinct, self-report measures of hedonic and eudaimonic well-being tend to be positively and strongly correlated (Gallagher et al., 2009; Hill, Mackinnon, et al., 2023; Joshanloo, 2016; Keyes et al., 2002) leading some to question the validity (or value) of differentiating these two forms of well-being (Kashdan et al., 2008). Nonetheless, there remains strong interest in understanding their similarities and differences (Huta & Waterman, 2014), not only in terms of experiences of well-being, but also with respect to how individuals live their lives (Ryan & Huta, 2009). For example, engaging in activities that are personally valued is an indicator of eudaimonic well-being (Scheier et al., 2006). More broadly, activities are a key component of many conceptualizations of eudaimonic well-being, such as worthwhile activities (White et al., 2017), personally expressive activities (Waterman, 1993), and eudaimonic motives for activities (Sheldon, 2016). Personal expressiveness refers to intense experiences of feeling more complete, fulfilled, or alive when participating in some activities compared to others. For example, when achievement strivers engage in activities that draw on their personality strengths (i.e., encourage their expression of competence), they experience increased well-being (Hill et al., 2023). As described by Waterman (1993), the personality-activity fit is a feeling of a special fit between the activity and the person's inherent abilities and is also reflected in an individual's sense that actions within the activity reflect who one really is and what one was meant to do.

The Flow State

Flow is a temporary state characterized by challenge-skills balance, merging of action and awareness, clear goals, unambiguous feedback, concentration, sense of control, loss of self-

consciousness, time transformation, and feelings of intensity (Csikszentmihalyi, 1975 in Norsworthy et al. 2021). In a flow state, a person feels that work is effortless, they are in control, performance concerns disappear, and time seems to stop still (Norsworthy et al., 2021). Nakamura and Csikszentmihalyi (2009; 2014) argue that the ideal conditions for flow are challenge-skills balance, clear goals, and unambiguous feedback. Being in a flow state is an enjoyable experience (Diener & Seligman, 2002; Ghani & Deshpande, 1994; Moneta, 2004; Vittersø & Søholt, 2011) and reflecting on flow experiences can increase well-being. Norsworthy et al. (2021) recently argued that a challenge-skills balance is the precondition or antecedent for flow, while enjoyment is a fundamental characteristic of flow. One reason for considering well-being as an outcome of flow may be that self-focused attention (which is minimized during a flow state) is what creates negative affect; when self-focused attention is absent, self-defeating processes like rumination do not occur (Nakamura & Roberts, 2016). Further, flow may contribute to positive development (e.g., well-being, increased motivation) through a broaden-and-build process. For example, flow improves previous learning satisfaction and future performance (Wang & Hsu, 2013) and actively contributes to effective learning (Andersen, 2016). Nakamura and Csikszentmihalyi (2009) suggested that when flow is achieved, new intrinsic motives emerge that facilitate further engagement, a cycle fitting Fredrickson's (1998) broaden-and-build theory. While flow is considered emotionless in the moment (as self-consciousness temporarily disappears), reflecting on the experience may bring feelings of happiness.

Activities, Competence, Flow, and Well-Being

People high in achievement striving tend to be concerned with occupational goals (e.g., completing a university degree with good grades) and feel competent at activities associated with pursuing their goals (e.g., intensive study; Hill et al., 2023), both of which promote their well-being. Achievement strivers are characteristically inclined to pursue personally valued activities that provide

a sense of competence and feeling competent boosts well-being. More broadly, being conscientious involves emotional and motivational mechanisms that make an individual likely to engage in flow promoting activities (i.e., they may be more likely to intentionally spend time to master a challenging task; Kappe & van der Flier, 2010), which is why conscientiousness is the personality trait most strongly linked to flow proneness (Ullén et al., 2012). Earlier work by Fredrickson (1998) showed that positive states such as flow increase well-being through broadening attentional, behavioral, and cognitive abilities and building intellectual and social resources. Although flow has traditionally been studied in people who hold elite skills and engage in performative settings (e.g., ballerinas, artists, rock climbers, and chess players; Csikszentmihalyi, 2014), flow is a state which can also be achieved in everyday activities (Baumann, 2012; Olčar et al., 2019). Flow is most likely to occur when individuals are engaged in activities where they feel challenged in their task but have the resources (e.g., skills) to adequately deal with the challenge. This challenge-skills balance is considered a primary dimension of flow (Csikszentmihalyi, 1975 in Noseworthy et al. 2021). Feeling you have the necessary skills in order to succeed at a task (i.e., feeling competent) may be a first, foundational step, in achieving a flow state, and experiencing a sense of competent should have stronger effects on well-being for individuals who strive for achievement (vs those low in achievement striving) because feelings of being skilled to succeed at a task would match their dispositional valuation of achievement. Overall, the literature on activities, competence, flow, and well-being, suggests that achievement-strivers will experience boosts in well-being when they pursue activities that give them a sense of competence and facilitate feelings of flow. This study aims to identify the order in which this process occurs, contributing to the scholarly debate on the role of flow and well-being mediators versus outcomes.

The Present Study

Much of the foundational knowledge of flow and well-being is drawn from samples characterized by elite skills and unique situations, such as athletes, musicians, and artists. Comparatively, much less is known about how flow can be experienced in everyday life, and particularly, through feeling competent at activities that are personally expressive. Thus, our objective is to assess the degree to which personally expressive activities boost achievement strivers' well-being through feelings of competence and flow. We assess this pathway both cross-sectionally and longitudinally to explore the temporal nature of achievement strivers' experience of well-being through feelings of competence and flow during personally expressive activities. Our first hypothesis is as follows:

H1: Achievement striving at will have a serial indirect effect on well-being at through competence and flow.

This can be tested first through five hypothesized pathways in one cross-sectional serial mediation model using Time 8.1 data, as depicted in Figure 8.1. Additionally, this hypothesis can be tested through a cross-lagged panel model incorporating both Time 1 and Time 2 data, as depicted in Figure 8.2. Though longitudinal models have long been considered superior to cross-sectional tests (Cole & Maxwell, 2003), if the time lag (i.e., distance between the measurement occasion) does not match the true data generating process, results may be misleading. Thus, we present both cross-sectional and longitudinal models to compare and contrast results.

As personally expressive activities are specific to an individual's personality strengths, understanding the types of activities that are most likely to improve well-being can inform positive psychology interventions, we also aim to answer two exploratory research questions:

Research Question 1: What types of personally expressive activities do individuals engage in?

Research Question 2: Which types provide the highest sense of competence and flow?

Method

Sample Size Determination

Because the overall study was designed to answer multiple research questions in addition to the results presented in the present paper, the initial sample size was determined with a precision analysis. A precision analysis for bivariate correlations indicated 352 participants would be sufficient to produce a 95% confidence interval half-width of ± .10 for correlations, assuming similar effect sizes to the average in social psychology research (r = 0.21; Richard et al., 2003). The present study came close to this target for Time 1 (N = 346), but attrition was high at Time 2 (N = 244; 29.5% attrition).

As indirect effects are generally smaller than their constituent bivariate correlations, we also calculated a series of sensitivity statistical power analyses for a serial indirect effect in the cross-sectional model using Monte Carlo simulations (Schoemann, Boulton, & Short, 2017), using 5000 replications, 20,000 Monte Carlo draws per rep (seed 1234), assuming a sample size of N = 346 and assuming equal correlations between all variables. Figure 8.3 shows we had sufficient (i.e., 80%) statistical power to detect indirect effects if correlations are around r = .25 or larger. Supplementary Figure S1 (https://osf.io/gn4tq/?view_only=f6f4ef20d4d44c228c7060055a305071) shows simulations for smaller samples, suggesting we have 80% statistical power to detect indirect effects if correlations are around .30 (N = 244) or .35 (N = 225) when considering Time 2.

Participants

Participants were drawn from a larger study on personality and well-being in academic settings and were postsecondary students who were taking at least one statistics course at their university (i.e., Dalhousie or York University). There were recruitment inclusion and exclusion criteria for the purposes of the larger study studying anxiety in statistics students but are unrelated to

the hypotheses tested in this paper. A participant flow diagram is depicted in Figure 8.4. The final sample size for this study was 346 participants at Time 1 and 244 participants at Time 2 (four months later).

At Time 1, the participants' age ranged between 17 and 47, with an average age of 21.02 (*SD* = 4.96%). Participants self-identified as women (70%), men (26%), non-binary (2.6%), or "prefer not to answer" (0.9%). Most of the sample were born in Canada (58.96%), followed by India (5.78%), and China (2.60%). See Table 8.1 for a full summary of socio-demographic characteristics.

Measures

Copies of all materials and measures used in this study, including measures not examined in the present paper, can be found on our OSF page [https://osf.io/gn4tq/?view_only=f6f4ef20d4d44c228c7060055a305071].

Achievement Striving

We used 10 items from the International Personality Item Pool to measure achievement striving (Jackson et al., 1996), from the broader factor conscientiousness of the Five Factor Model (McCrae & John, 1992). Participants rated their agreement on items such as "go straight for the goal." This averaged scale has previously shown good internal consistency (a = 0.89; Hill et al., 2023), and moderate test-retest reliability (α = 0.78).

Well-Being

Well-being was measured with two single-item measures: life satisfaction (i.e., hedonic or evaluative well-being) and life worth (i.e., eudaimonic well-being). The 10-point life satisfaction measure asks, "How satisfied are you with your life in general?" and provides two anchor labels (1 = very dissatisfied, 10 = very satisfied). The 10-point life worth measure asks, "To what extent you feel the things you do in your life are worthwhile?" and provides two anchor labels (1 = not at all, 10 =

completely). Though the reliability and validity of single-item well-being measures have been challenged, research suggests they are psychometrically sound (Lucas & Donnellan, 2007; Moldovan, 2017), and they are feasible for inclusion in multi-purpose surveys. For example, single-item well-being measures perform similarly to multiple-item well-being scales and do not produce systematically different correlations compared to multiple-item well-being measures on theoretically relevant variables (Cheung & Lucas, 2014). The reliability of single-item measures has been deemed moderate to acceptable (Anusic & Schimmack, 2016; Krueger & Schkade, 2008; Lucas & Donnellan, 2007; Schimmack & Oishi, 2005).

Personally Expressive Activities

We used one item from the Personally Expressive Activities Questionnaire – Standard form (PEAQ-S) (Waterman, 1993, 2004) to gather open-ended information about personally expressive activities. Participants were asked to name one activity of personal importance that they "would use to describe themselves to another person." The activities listed were then piped into the remaining questionnaires (competence and flow) with the items phrased as completions of a common stem: "When I engage in…"

Competence

The Perceived Competence Scale was originally developed to measure people's feelings of competence during medical school (Williams & Deci, 1996) and in patients managing their glucose levels during diabetes (Williams et al., 1998). The 4-item scale is scored on a 7-point scale (1 = not at all true, 7 = very true), items were averaged, and was measured in relation to the activity described by each participant using branching logic in the survey software; a sample item is: "I am capable to engage in this activity." On average, Cronbach's alpha has been good in past studies ($a > 0.80$; Williams et al., 1998; Williams & Deci, 1996).

Flow

The experience of flow was measured using the Absorption subscale (4 items) of the Flow Short Scale (Rheinberg et al., 2003) and in relation to the previously described activity, which was piped in using branching logic in the survey software. The item completions for this scale were: (a) I feel just the right amount of challenge, (b) I do not notice time passing, (c) I am totally absorbed in what I am doing, (d) I am completely lost in thought. Each item was measured on a 7-point scale ranging from "not at all" to "very much," and was averaged. Cronbach's alpha for the overall scale was previously high (.90; Rheinberg et al., 2003).

Procedure

The research was approved by the Institutional Research Ethics Board at Dalhousie University (2022-6038) and York University (e2022-187). The survey was administered through SurveyMonkey, an online survey platform and took about 45 minutes to complete. Participants were collected through two separate methods (a) students involved in the undergraduate participation pool at two universities; (b) through flyers and online advertisements to students enrolled in statistics classes; (c) when permitted by course instructors, short presentations or videos presented to students inviting them to participate; and (d) email notifications for Time 2. They had to participate in the first wave of the study in the first month of classes.[8] No other inclusion/exclusion criteria were applied to maximize generalizability and feasibility. During the first survey, students were able to choose between cash or bonus points (or a combination), through the following compensation models: 1) A $25 Amazon gift card ($10 for completing the first survey and $15 for completing the second survey), or 2) bonus credit points for an eligible psychology class using the

[8] As this study is part of a larger study on personality, well-being, and academic experiences in university students, participants must have participated in the second wave after they have received their final grades in their classes, approximately 4 months later.

undergraduate participant pool system and an Amazon gift card (1 bonus point for the first survey and a $15 gift card for completing the second survey). Overall, recruitment began September 6, 2022 and finished on June 24, 2023). Because Time 1 surveys were administered at the beginning of an academic term, there were two cohorts (Fall 2022 and Winter 2023). More specifically, the Fall 2022 cohort (N = 313) filled out their first survey in the first five weeks of the Fall term (between September 6 and October 14, 2022) and their second survey in the first five weeks of the Winter term (between January 11 and February 16, 2023). The Winter 2023 cohort (N = 110) filled out their first survey in the first four weeks of the Winter term (between January 18 and February 20, 2023) and second survey in the four weeks following the Winter term (between May 25, 2023 and June 26, 2023). Because the processes under study likely generalize to Canadian university students more broadly, samples from both universities (Dalhousie and York) and both cohorts (Fall 2022 vs. Winter 2023) were merged into a single dataset.

Analytic Plan

Quantitative. The data, syntax, codebook, questionnaires, and supplemental material for this study can be found on our OSF page (https://osf.io/gn4tq/?view_only=f6f4ef20d4d44c228c7060055a305071). Cross-sectional serial mediation models were tested using the *lavaan* package in *R* (Rosseel, 2012) with bootstrapped standard errors using 5000 resamples. First, hypotheses were tested with two separate cross-sectional serial mediation models at Time 1 only (see Figure 8.1 for a conceptual model). School and cohort were entered as covariates. The two models differed by dimension of well-being outcome (hedonic vs. eudaimonic), and all data are Time 1. Standardized (β) coefficients are reported. All coefficients are reported in Tables S1 and S2 (https://osf.io/gn4tq/?view_only=f6f4ef20d4d44c228c7060055a305071).

The hypothesized indirect effect was also analyzed using a two-wave cross-lagged panel model (depicted in Figure 8.2) to predict Time 2 well-being while controlling for Time 1 variables.[9] The two-wave cross-lagged panel model allows for a longitudinal mediation model without requiring three waves of data (Little et al., 2007). The cross-lagged panel model requires the assumption that the variables themselves and the relationships between them remain stationary throughout the time. Additionally, the assumption of synchronicity requires that the data for each time point was truly collected at approximately the same time. This is reasonable, as all participants responded to the survey within a limited time range (about one month) for both waves of data collection. Model fit was assessed using multiple fit indices. A well-fitting model is suggested by a non-significant chi-square, a comparative fit index (CFI) and a Tucker-Lewis index (TLI) around .95, and a root-mean-square error of approximation (RMSEA) around .08 (Kline, 2023).

Missing data. After exclusions, there were 346 participants at Time 1, but attrition was high at Time 2 (N = 244; 29.5% attrition). Nineteen participants are missing well-being outcome data at Time 2; thus the models use the 225 participants who have data for each variable in the specified model (35% missing). At the item level, missing data ranged from 0.58% (a competence item) to 3.18% (life worthwhileness). Scale totals were calculated by averaging all items; thus, if some items were missing for a given participant, their total score would be the average of items completed. Predictors of missingness were investigated; participants recruited from York University had a greater proportion of missingness than Dalhousie University (38.3% vs 29.1%), and the Winter 2023 cohort had more missing data than the Fall 2022 cohort (45.1% vs. 30.2%). Thus, school and cohort were included as covariates in the serial mediation models and auxiliary variables in the cross-

[9] We also conducted supplementary exploratory analyses, assessing the cross-lagged panel models with one mediator each. In other words, we ran an additional model predicting Time 2 Life Satisfaction with just competence (without flow), and another model with just flow (without competence). Then, we ran an additional model predicting Time 2 Life Worth with just competence, and another model with just flow. None of the four exploratory models indicated a significant indirect effect through the one mediator. These analyses are presented in Tables A2-A5 in Appendix B.

lagged panel model; no other variables in the model predicted missingness. For the cross-lagged panel models, we used auxiliary variables (package *semTools*; Jorgensen et al., 2022) and handled missing data using full information maximum likelihood approach for hypothesis testing and using listwise deletion for descriptive statistics. Auxiliary variables are variables that can help to make estimates on incomplete data, but are not part of the main analysis (Collins et al., 2001). Including auxiliary variables has the most impact when their correlation with missingness is high (greater than .4) and when the amount of missing values is large (greater than 25%; Collins et al., 2001; Graham, 2003). Missing data was relatively minor for the ANOVA analyses (0.5%) so listwise deletion was used.

Content coding of open-ended data. To answer the exploratory research questions, the personally expressive activities were first thematically categorized into six project types, based on: a) common types of activities reported in positive psychology literature (Hill et al., 2023) and b) a pilot coding of project types on 100 participant's listed activity. First, two coders (TH and JL) independently reviewed the listed activities and drafted a list of possible activity types. After a comparison and discussion of the potential activities categories, the coders both independently coded the first listed 100 activities into the categories. Then, the categories were discussed, and some refinements were made. After the final seven categories were agreed on, the two coders categorized the remaining activities. Discrepancies were resolved through discussion to arrive at a final categorization for each activity. For all activities, inter-rater reliability, measured as percentage of agreement before consensus, was 92.5%. Cohen's kappa was calculated using the package *irr* (Gamer et al., 2019) which showed $\varkappa = .901$, a near perfect level of inter-rater reliability (McHugh, 2012). To assess differences in levels of flow by activity type, we used a one-way ANOVA using a Welch F-test and the Games-Howell method for post-hoc tests which are appropriate for unequal variances (Field et al., 2012).

Results

Descriptive statistics on both demographics and on key study variables (with reliability of measures) are displayed in Table 8.1 and 8.2, respectively. Both the cross-sectional serial mediation models and longitudinal cross-lagged panel models test indirect effects leading from achievement striving to competence need satisfaction, through to flow, then to well-being. The serial mediation models use only Time 1 measures, and control for sample recruitment characteristics (i.e., school and cohort). The cross-lagged panel models includes measures at both time points, and includes school and cohort as auxiliary variables. Across both statistical techniques, Model 1 represents the hedonic well-being outcome of life satisfaction and Model 2 represents the eudaimonic well-being outcome of life worth. Some coefficients are omitted from the results for clarity (e.g., paths for covariates), but supplementary material includes all standardized serial mediation model coefficients (Tables S1-S2) and all standardized cross-lagged panel model coefficients (Tables S3-S4; https://osf.io/gn4tq/?view_only=f6f4ef20d4d44c228c7060055a305071).

Correlations between key study variables are presented in Figure 8.5. Achievement striving at Time 1 was positively correlated with other Time 1 variables except for flow; the relationship with age ($r = .13$) was weak, and the relationships with competence ($r = .39$) and well-being (average between well-being types: $r = .33$) were moderately high. Thus, compared to those who were lower in achievement striving, the achievement strivers tended to be slightly older, experience more competence when engaging in personally expressive activities, and feel happier. These relationships were generally similar for Time 2 variables, although eudaimonic well-being was more strongly related to other Time 2 variables than hedonic well-being and was related to flow. Competence at Time 1 was strongly, positively correlated to flow at Time 1 ($r = .51$), and weakly, positively correlated to both Time 1 well-being (average $r = .22$) and Time 2 life worth (but not life

satisfaction; $r = .15$). Flow at Time 1 was weakly, positively correlated to well-being at Time 1 (average $r = .14$), but not at Time 2.

Quantitative Analyses

Model 1: Life Satisfaction. The cross-sectional serial mediation model's indirect effects are displayed in Figure 8.6, with all coefficients in Tables S1. We did not find a significant serial indirect effect, wherein achievement striving indirectly predicted life satisfaction through competence and flow. Achievement striving had a moderate positive total effect on life satisfaction, $\beta = .29$, 95% CI [.19, .39]; neither competence nor flow significantly predicted well-being. Achievement striving was moderately, positively related to competence, $\beta = .39$, 95% CI [.26, .52], which in turn was strongly, positively related to flow, $\beta = .57$, 95% CI [.46, .67]. The relationship between achievement striving and flow was weak and negative, but significant, $\beta = -.14$, 95% CI [-.24, -.04].

The cross-lagged panel model (Figure 8.7), which tested the same hypothesized paths but while controlling for Time 1 variables and using Time 2 mediators, fit the data well: $\chi^2(6) = 11.02$, $p = .09$; CFI = .99; TLI = .97; RMSEA = .05 (90% CI [.00, .09]). All autoregressive paths with T1 variables predicting the same variable at T2 were large and statistically significant; however, none of the hypothesized cross-lagged paths were statistically significant.

Model 2: Life Worth. The cross-sectional serial mediation model's indirect effects are displayed in Figure 8.8, with all coefficients in Table S2. We did not find a serial indirect effect, wherein achievement striving indirectly predicted life worth through competence and flow. Achievement striving had a moderate, positive total effect on life worth, $\beta = .36$, 95% CI [.26, .46], and a moderate, positive effect on competence, $\beta = .39$, 95% CI [.26, .52]. Additionally, achievement striving was weakly, negatively related to flow, $\beta = -.14$, 95% CI [-.24, -.04], which in turn significantly, albeit weakly, predicted well-being ($\beta = .12$, 95% CI [.01, .25).

The cross-lagged panel model (Figure 8.9), which tested the same hypothesized paths but while controlling for Time 1 variables and using Time 2 mediators, fit the data well: $\chi^2(6) = 13.37$, $p = 04$; CFI = .99; TLI = .95; RMSEA = .06 (90% CI [.01, .10]). All autoregressive paths with T1 variables predicting the same variable at T2 were large and statistically significant; however, none of the hypothesized cross-lagged paths were statistically significant.

Overall Cross-Lagged Panel Model:

Achievement striving, competence, flow, and well-being at T1 accounted for about a substantial amount of the variance in well-being at T2, while considering all other variables at T2 as covariates (life satisfaction: 40%; life worth: 30%).

Exploratory Analyses

The personally expressive activities were categorized in one of seven types (Table 8.3). The most common types of activity fell in the physical fitness category (30.06%); the least common category was connection to people or nature (9.25%). The overall *F*-test suggested that there was a difference in flow across the 7 activity types, $F(6,125.68) = 6.52$, $p < .001$, $\omega^2 = 0.20$. Results were further probed with post-hoc tests. Overall, 2 of 21 post-hoc tests were statistically significant after adjusting for familywise error. The Time 1 data showed that flow was significantly higher in reading and writing activities than personal/self-care ($M_{difference} = 1.04$, 95% CI [0.33, 1.75]) and occupational activities ($M_{difference} = 1.20$, 95% CI [0.48, 1.92]; Figure 8.10). Levels of competence did not differ by activity type (Figure 8.11), $F(6,124.68) = 1.27$, $p = .28$, $\omega^2 = .01$. Visually, the pattern of means by activity type share one key difference across flow and competence (personal/self-care activities tended to have the lowest level of competence and flow reported) but two key differences: people rated academic/occupational and connections as higher in competence than in flow. Means and standard deviations are depicted in Figures 8.10-8.11.

Discussion

The purpose of this study was to test the processes through which achievement striving leads to both hedonic and eudaimonic well-being over time. Feeling competent and in flow during personally expressive activities did not increase achievement strivers' well-being concurrently or four months later. In fact, competence did not directly influence well-being in the short or long term. Although achievement strivers tended to feel competent and happy (significant direct effects and bivariate correlations), the hypothesized mediating pathway to well-being was not supported.

Achievement Strivers Tend to Feel Competent and Happy

Broadly, research shows that achievement strivers have characteristic emotional and motivational mechanisms that predispose them for feeling competent and experiencing well-being. Though the present study did not provide evidence of a mechanism, we can speculate about alternative mechanisms. The pursuit of ambitious goals may be associated with an upward spiral of motivational resources and progress in goal-directed behaviours. Conscientious people tend to be high in trait inspiration, in addition to having high goal inspiration (Milyavskaya et al., 2012); when they feel effective and proud of their accomplishments, achievement strivers' emotional and motivational resources may be utilized and strengthened. As Milyavskaya et al. (2012) theorized, goal progress and goal inspiration may have a reciprocal relationship which creates the upward spiral of successful goal pursuit. The overall beneficial outcome of the upward spiral is that individuals are transformed, such that they become "more creative, knowledgeable, resilient, socially integrated, and healthy" (Fredrickson, 2004, p. 153). Sheldon and Houser-Marko (2001) used a five-wave panel design to test if the upward spiral of broaden-and-build theory holds for goal striving and motivation. More specifically, if initial self-concordant motivation (i.e., goals that are aligned with one's values and beliefs; Milyavskaya et al., 2014; Sheldon & Elliot, 1999) would indirectly predict

increased well-being through goal attainment, creating a self-reinforcing cycle (i.e., increased motivation for future striving, even better attainment, and then further increases in well-being). When initiated, maintaining the upward spiral is a different story. Sheldon & Houser-Marko (2001) further found that while increasing one's level of well-being is possible, few participants were able to further increase their well-being after the first upward spiral. These findings suggested that self-concordant motivation may be the key driver of this process, in that people need to 'strive for the right reasons' (p. 152).

Flow and Well-Being

Experiencing flow directly predicted life worth (but not life satisfaction) concurrently, but we found no longitudinal relationships between flow and outcomes. Research suggests people who are naturally persistent and intrinsically motivated in everyday life are particularly flow prone, which increases well-being both indirectly (Tse et al., 2021) and directly (Peterson et al., 2007; Tse et al., 2020). That is, daily diary and cross-sectional evidence suggest that flow increases well-being (Tse et al., 2020, 2021). In fact, Tse et al. (2020) suggest that well-being is shaped by the ease with which one can engage in, enjoy, and become absorbed in activities. In particular, sustainable increases in well-being is possible by engaging in and enjoying a variety of activities, rather than narrowly focusing in on one specific activity. The null indirect findings may be due to measurement error. By asking participants to name just one personally expressive activity, they named the activity that is most important to their current life goals, but did not have an opportunity to list the potentially rich and varied activities that add quality to their lives. Further, this study is drawn from a sample of post-secondary students who tend to experience higher stress (American College Health Association, 2019) that can be severe (Linden & Stuart, 2019), which may increase rumination tendencies, particularly for those higher in neuroticism (Zuo et al., 2024). Neuroticism is linked to low flow proneness (Ross & Keiser, 2014; Ullén et al., 2012) and to decreased well-being (Liu et al.,

2023; Steel et al., 2008). Thus, our participants could be less likely to engage fully in personally expressive activities and instead, devote their effort into their studies, thus diminishing their proneness to experiencing flow and the associated psychological benefits.

Types of Personally Expressive Activities

Personally expressive activity types include those that are productive, social, athletic, arts-related, values-related, and media-related (Waterman, 2003), which can further be classified as low effort (hedonically motivated) activities or high effort (intrinsically motivated) activities (Waterman, 2005). Physical fitness and occupational activities (our two most commonly reported personally expressive activities) are intrinsically motivated, according to Waterman (2005)'s description of high effort enjoyable activities. Creative arts, personal/self-care, general interest hobbies, reading and writing, and connecting with people and places would be considered hedonically motivated activities, in that they require little effort but are enjoyed. Our participants' high effort enjoyable activities were only associated with mid-range levels of flow and did not provide higher feelings of competence than other activity types. Flow activities are those with conditions such as goal and feedback structures that make flow more likely (Nakamura & Csikszentmihalyi, 2002). One can experience flow in virtually any activity; as Nakamura & Csikszentmihalyi (2002) stated, 'a museum visit, a round of golf, a game of chess' (p. 242) can all be experienced with boredom or anxiety, it is the challenge-skills balance condition which is key to flow. Levels of flow were highest in reading and writing activities, which has supports previous reports that flow is attainable when engaged in activities such as literary writing (Perry, 1999). As described by Coatsworth et al., 2006, people "typically engage in a wide range of activities that they can use to define themselves" (p. 165), and being a student is considered a social identity (White et al., 2011), experiencing flow during reading and writing may be attributable to the nature of students' everyday lives.

Flow During Reading and Writing

Research on flow has been blossoming within language and learning research because flow-facilitating conditions are present in reading and writing (Czimmermann & Piniel, 2016; Liu et al., 2022), as well as general learning processes (Payant & Zuniga, 2022), likely due to the presence of interest. The body of literature surrounding the study of flow in additional language learning (Aubrey, 2017b, 2017a; Cho, 2018; McQuillan & Conde, 1996; Zare-ee, 2013; Zuniga & Payant, 2021) highlights that intrinsically interesting and collaborative tasks which offer clear goals and feedback, present appropriate challenge, and support learning autonomy can create conditions for the experience of flow within the classroom. There has even been a reading-specific flow scale developed (Thissen et al., 2018). Being flow-prone (e.g., being high in trait absorption (Rheinberg et al., 2003) not only increases levels of intrinsic interest in activities, but also strengthens positive emotions (Li et al., 2019; Özhan & Kocadere, 2020). For example, after experiencing flow, people have reported increased positive achievement emotions (e.g., pride and satisfaction) in addition to a higher sense of well-being (Pekrun, 2006). Indeed, flow during reading has been linked to increased motivation for reading and learning (Piniel & Albert, 2017; Shernoff et al., 2003; Liu & Song, 2021). On the other hand, Fink & Drake (2016) found that flow may not be achievable after a single writing session. As previously highlighted by Waterman (1995) it is purposeful and repeated engagement that is required to enter a flow state and to experience positive outcomes, such as improved well-being. This can lead to increased discovery of one's interests, abilities, and potentials in the future (Waterman, 1995). When English language learners engage in repeated, regular reading sessions, they report flow (Kirchhoff et al., 2013), which has increased their interest and understanding of the material (Zare-ee, 2013), although flow may be particularly likely when reading for pleasure and intrinsic interest (McQuillan & Conde, 1996).

A Few Statistical Addendum

Competence was not directly related to well-being after controlling for all other variables in the model; this is most likely because achievement striving was strongly correlated with competence. That is, it did not predict unique variance above and beyond achievement striving. The weak, negative effect from achievement striving to flow (i.e., a flipped sign from the bivariate correlations) is most likely due to strong relationship between competence and flow. As an endogenous variable in the serial mediation model, flow is the residual after partialing out competence. Considering the strong effect of competence on flow, the residual variation in flow may represent a very different construct (i.e., flow for reasons other than competence). Finally, achievement strivers do experience high levels of competence and well-being, evident through direct effects and bivariate correlations, but not through indirect effects. Though many of our effects were non-significant the confidence intervals remain informative. For example, the serial mediation models' confidence interval of standardized effects of competence on life satisfaction show that plausible values for the population slope (i.e., the true effect) is between -.20 and .26. This suggests that if a relationship does exist between competence and well-being, it is likely not larger than these values. The power simulations enabled us to rule out indirect effects derived from bivariate correlations of $r = 0.25$ cross-sectionally, but if smaller effects exist our study cannot detect them. Taken together, these findings suggest that there are not medium to large effects in the population, but our data are not informative for smaller effect sizes.

Limitations

Sample homogeneity. As this study is part of a larger study on personality and well-being in university students, we recruited participants from two university participant pools and campus flyers, which provides a relatively homogenous sample in terms of gender and ethnic background.

As a result, our sample is comprised of mostly White young women in statistics classes, which limits the degree to which our results apply to the general population.

Too few activities. The original Personally Expressive Activities Questionnaire asks a participant to identify five activities of personal importance that they would use to describe themselves to another person which is likely burdensome for participants. Accordingly, we only asked for one personally expressive activity, which required participants to prioritize one activity. By reducing the number of personally expressive activities, participants may have chosen one general activity that oversimplifies their idiosyncrasies.

Missing data. Due to a survey software piping error and attrition, our sample size for those who have data for each variable in the tested models shrunk to 346 (cross-sectional) and 225 (longitudinal). Thus, the inconclusive results may also be attributable to the small sample size that rendered our dataset underpowered for detecting any longitudinal effects less than $r = 0.3 – 0.325$ ($N = 244$ and 225, respectively), and cross-sectional effects less than $r = .25$.

Time lag. Finally, our survey design included surveys 4 months apart and this lag might have been too long to assess change in well-being longitudinally. Previous studies measuring positive psychological processes (e.g., savoring, need satisfaction, eudaimonic motives for activities) have found evidence of well-being boosts with lags of one day (Jose et al., 2012; Sheldon & Niemiec, 2006; Steger et al., 2008). While hedonic happiness is more malleable on a day-to-day level (as it is akin to positive emotional states), sustainable changes in eudaimonic well-being (such as life worthwhileness) are more challenging to induce and to detect.

Cross-lagged panel design limitations. The primary critique of a two-wave CLPM is that it does not account for the stability of individual differences (Hamaker et al., 2015). That is, if the stability of a construct is somewhat trait-like (i.e., does not vary much over time), the autoregressive paths specified in the CLPM would not account for this and lagged parameters (i.e., Time 1 to Time

2) would not represent the true within-person relationships over the two-waves. However, for longitudinal mediation, a CLPM is sufficient and does not require three waves. The two-wave cross-lagged panel design assumes the variables and the relationships between them are stationary from Time 1 to Time 2 and assumes synchronicity (data for each time point was truly collected at approximately the same time), which were both met in this study.

Future Directions

Foundationally, researchers should assess if these findings hold in non-student samples. Conceptually, as we focus on the basic psychological need satisfaction of competence in keeping with our interest in ambitious types of people, assessing how different types of personality traits lead to well-being through the two remaining basic psychological needs would provide a fuller picture of how flow fits into basic psychological need satisfaction. For example, people high in openness to experience may be more prone to engaging in personally expressive activities that encourage flow states, particularly when autonomously pursued. Likewise, people high in extraversion may have a higher need for relatedness and may pursue personally expressive activities that include social connections. Methodologically, efforts to identify alternative mechanistic pathways from achievement striving to well-being would help elucidate how, when, and why achievement strivers feel happy, beyond simple competence need satisfaction. A daily diary study would help illuminate the daily nuances of these relationships, such as experiencing basic psychological need satisfaction and well-being. Painting a picture of the daily motives, activities, and experiences of achievement strivers could help identify characteristics of personally expressive activities (e.g., frequency, duration, intensity, absorption) that help produce competence-promoting experiences. Finally, a new direction in the positive psychology of everyday life is the idea of a psychologically rich life (Oishi et al., 2019). Exploring if people who are flow prone tend to pursue rich life experiences, or if those who report a psychologically rich life tend to engage in more personally expressive activities, would

be an insightful avenue for building knowledge on what the nuances of well-being looks like in everyday life.

Conclusions

Though achievement strivers in our data tended to feel happy and competent, the mechanistic pathway to well-being is not yet clear. Nonetheless, through cross-sectional and longitudinal analyses on closed-ended and open-ended data, as well as a series of power simulations, we were able to rule out medium to large serial indirect effects of achievement striving on well-being through competence and flow, but smaller effects might exist.

Figure 8.1

Proposed Cross-Sectional Serial Mediation Model

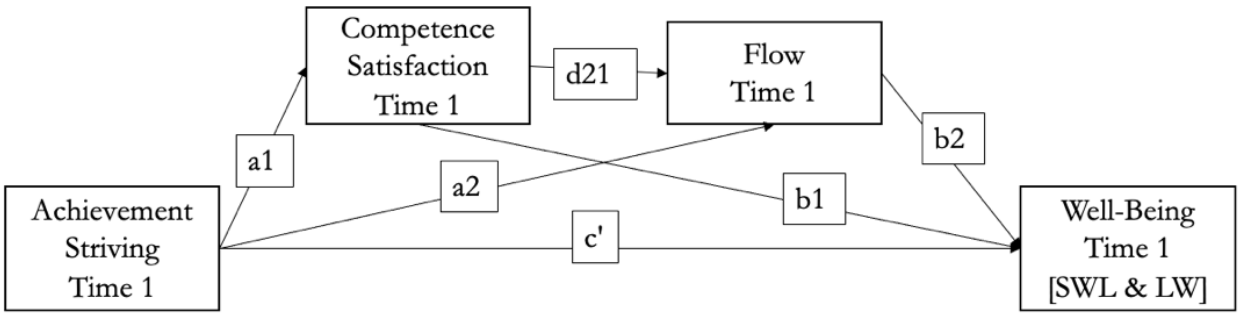
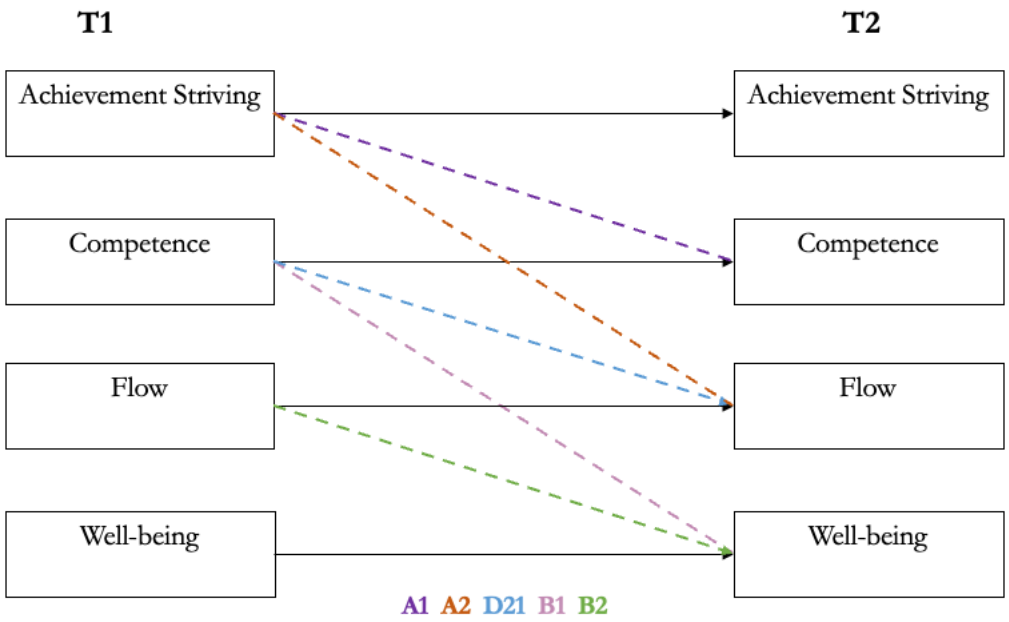


Figure 8.2

Proposed Cross-Lagged Panel Model



Note. Solid lines represent covariance between variables over time. Bolded, colored, and dashed lines represent hypothesized paths for the indirect effect, according to the color key at bottom. T1 = Time 1 and T2 = Time 2

Figure 8.3

Power Simulations for Individual and Overall Indirect Effects Based on N = 346

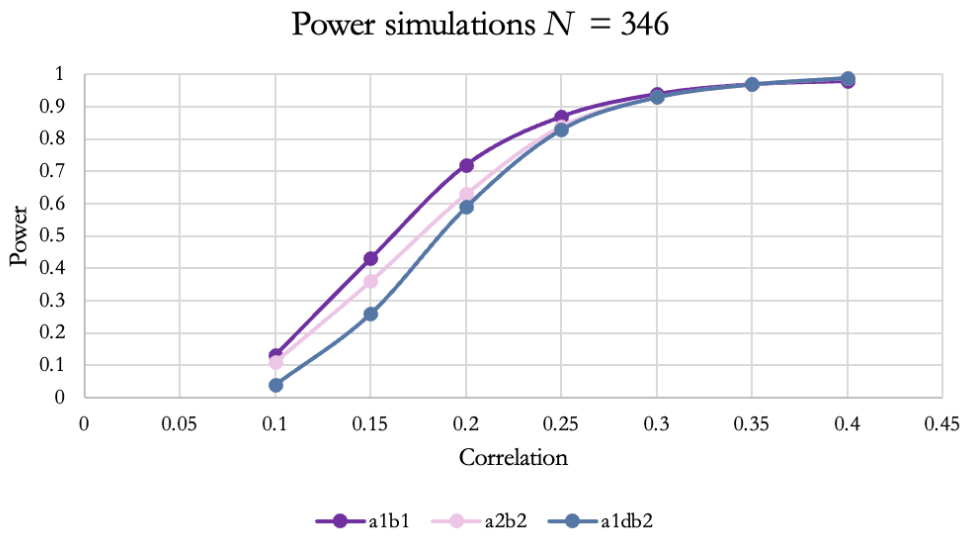


Table 8.1

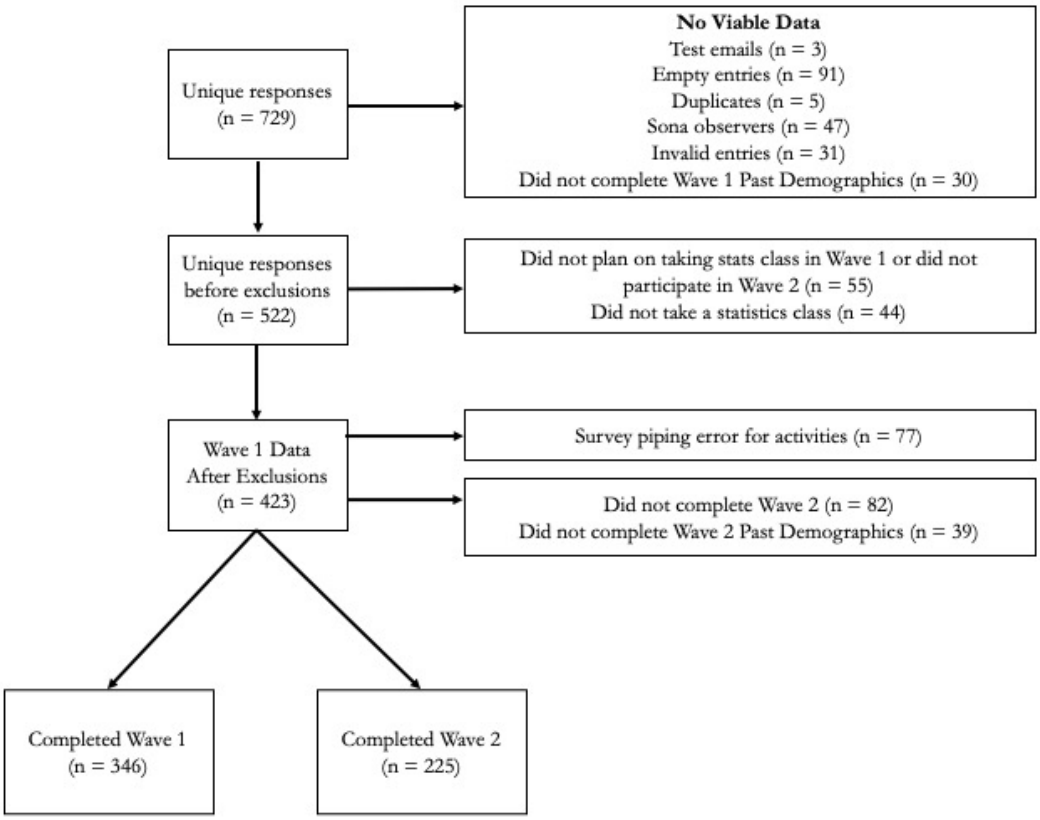
Socio-demographic Characteristics

Variable	*M* (SD) [Range] or *n* (%)
Age	21.02 (4.96) [17-47]
Gender	
Man	89 (26%)
Woman	242 (70%)
Other, not listed	3 (0.9%)
Non-binary	9 (2.6%)
Prefer not to answer	3 (0.9%)
Current level of education	
Undergraduate degree	336 (97%)
Graduate degree	9 (2.6%)
Prefer not to answer	1 (.03%)
Year in program	2.12 (1.12) [1-10]
1	96 (28%)
2	175 (51%)
3	34 (9.8%)
4	29 (8.4%)
5	7 (2%)
6	4 (1.2%)
10	1 (0.3%)
Born in Canada	204 (58.96%)

Note. Categories may not add up to below or above 100% due to participants' option to check more than one option (e.g., reporting both an undergraduate and graduate degree instead of reporting highest level).

Figure 8.4

Flow Chart of Participant Attrition



Note. A Sona observer is a student who participated in the study for course credit, but did not consent to have their data used for research. As this study is part of a bigger study on the role on student's personality and academic experiences, some participants were not invited to complete Wave 2 due to the broader study's design (e.g., those who did not take a statistics class).

Table 8.2

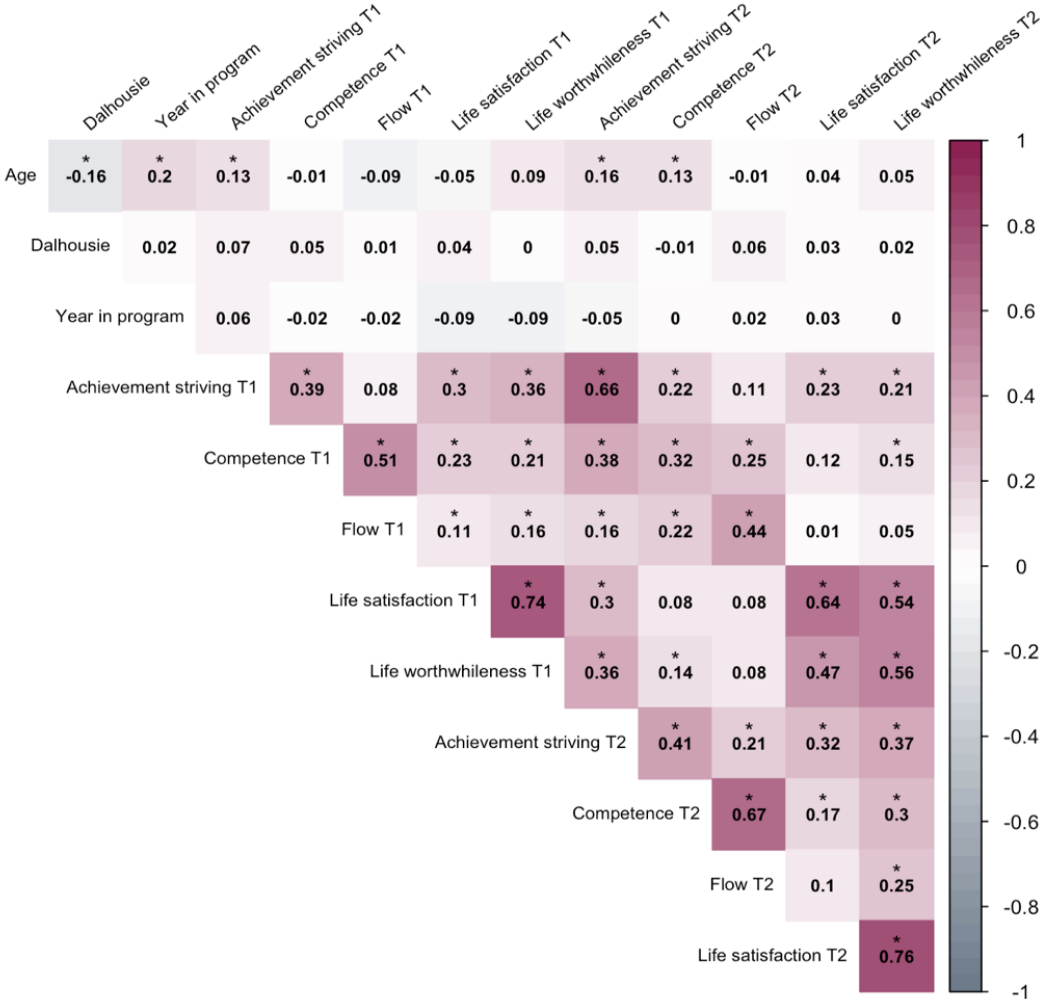
Scale Descriptives and Internal Consistency

Variable	***M (SD)***	**Cronbach's alpha**
T1Achievement Striving	5.33 (0.99)	0.86
T1 Competence	6.01 (1.01)	0.87
T1 Flow	5.65 (1.13)	0.76
T2 Life Satisfaction	6.62 (2.06)	--
T2 Life Worth	6.84 (2.46)	--

Note. T1 = Time 1 and T2 = Time 2; the two well-being items are single-items and do not have an internal consistency value.

Figure 8.5

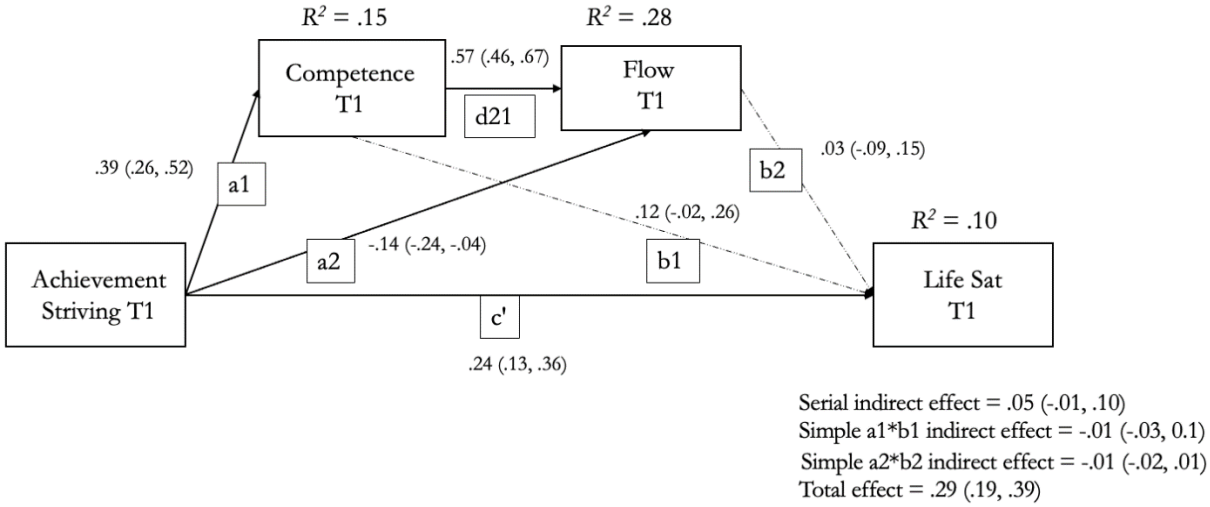
Bivariate Correlations Between Study Variables



Note. Blue represents negative correlations and burgundy represents positive correlations. * $p <$ 0.05. T1 = Time 1, T2 = Time 2

Figure 8.6

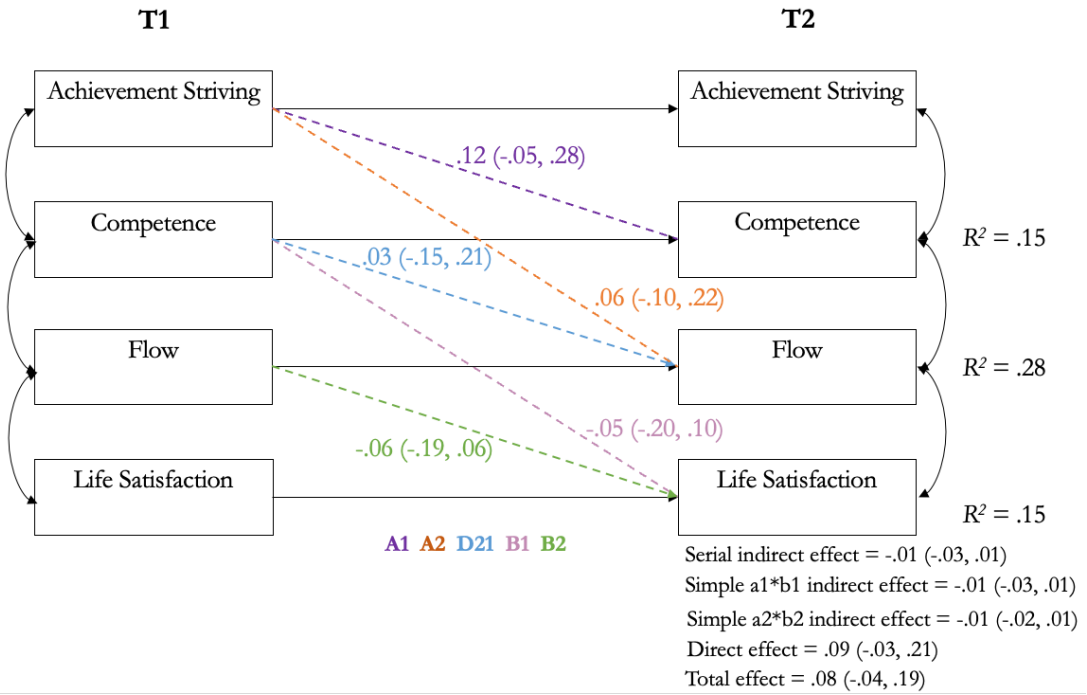
Results of Serial Mediation Model Testing the Indirect Effect of Achievement Striving on Life Satisfaction (Hedonic Happiness) through Competence and Flow



Note. Bolded lines are significant, dashed are insignificant. Standardized coefficient with 95% CI

Figure 8.7

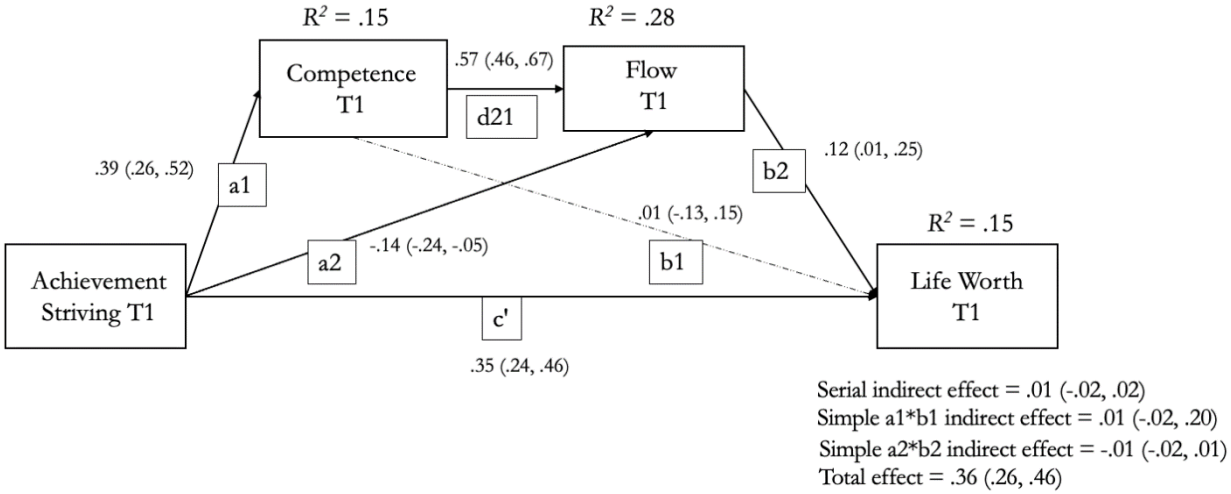
Results of Cross-Lagged Panel Model Testing the Indirect Effect of Achievement Striving on Life Satisfaction (Hedonic Happiness) Through Competence and Flow



Note. Standardized coefficients with 95% CI. T1 = Time 1 and T2 = Time 2. Cohort and school included as auxiliary variables to predict missingness. Only selected coefficients shown, see table S3 for all coefficients.

Figure 8.8

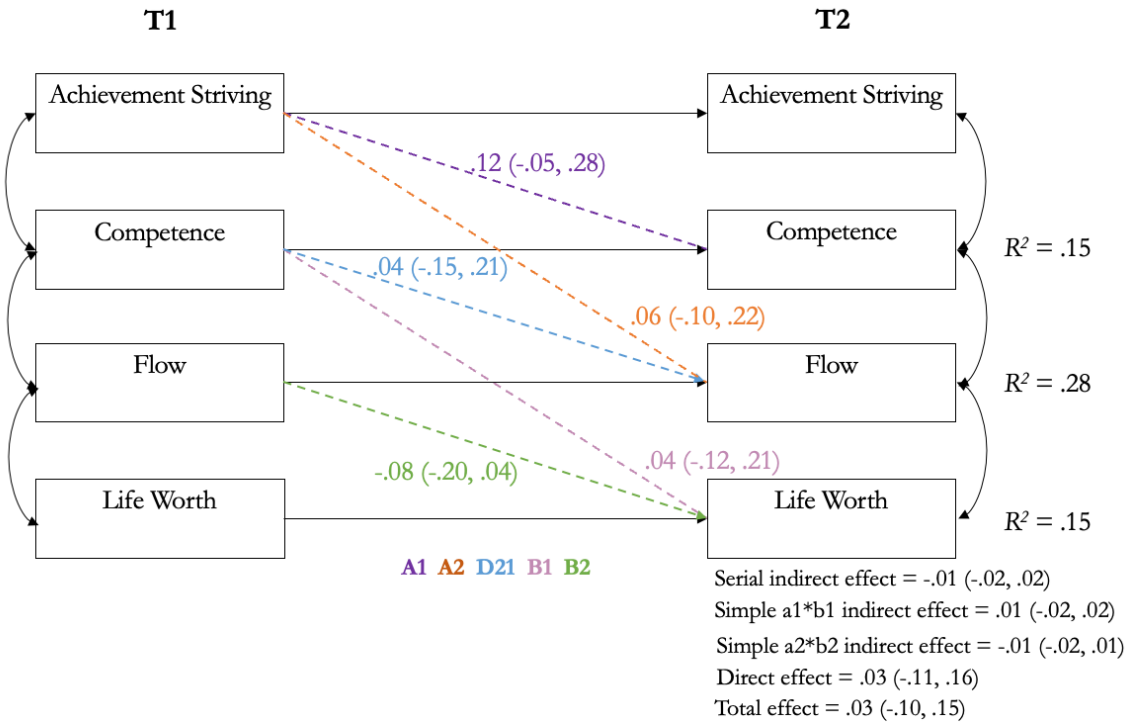
Results of Serial Mediation Model Testing the Indirect Effect of Achievement Striving on Life Worth (Eudaimonic Well-Being) through Competence and Flow



Note. Bolded lines are significant, dashed are insignificant. Standardized coefficient with 95% CI

Figure 8.9

Results of Cross-Lagged Panel Model Testing the Indirect Effect of Achievement Striving on Life Worth (Eudaimonic Well-Being) Through Competence and Flow



Note. Standardized coefficients with 95% CI. T1 = Time 1 and T2 = Time 2. Cohort and school included as auxiliary variables to predict missingness. Only selected coefficients shown, see Table S4 for all coefficients

Table 8.3

Types of Personally Expressive Activities

Types of Activity	Example	*N*
Academic/Occupational	My studies	48 (13.87%)
Connection to People or Nature	Being outside in nature	32 (9.25%)
Creative Arts	Crafts	42 (12.14%)
General Interest Hobbies	Baking	36 (10.40%)
Personal/Self-Care	Journaling	49 (14.16%)
Physical/Fitness	Running	104 (30.06%)
Reading and Writing	Reading books	35 (10.12%)

Figure 8.10

Level of Flow at Time 1 by Activity Type

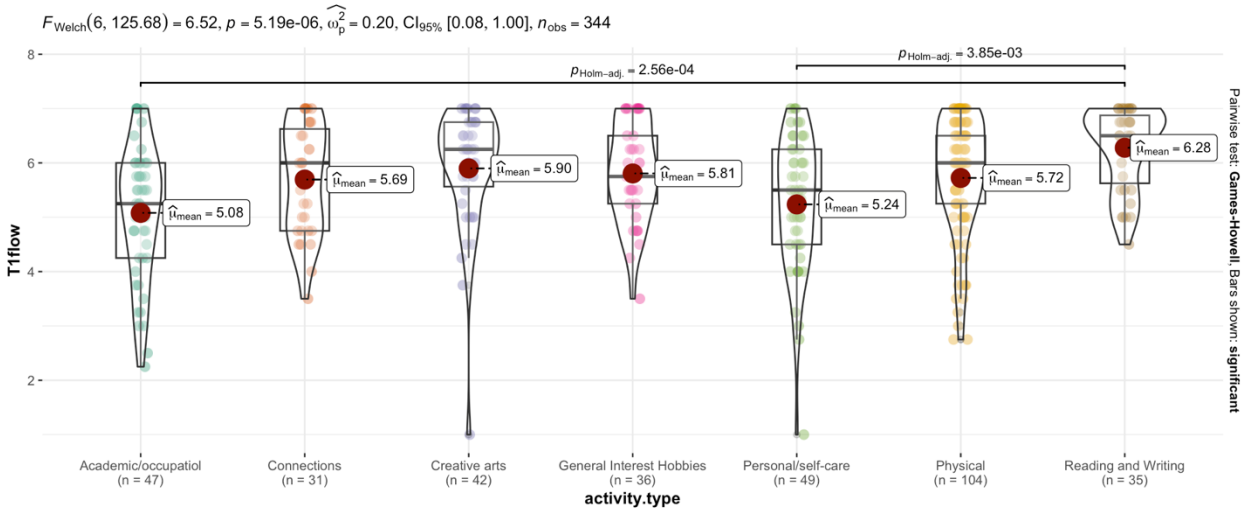
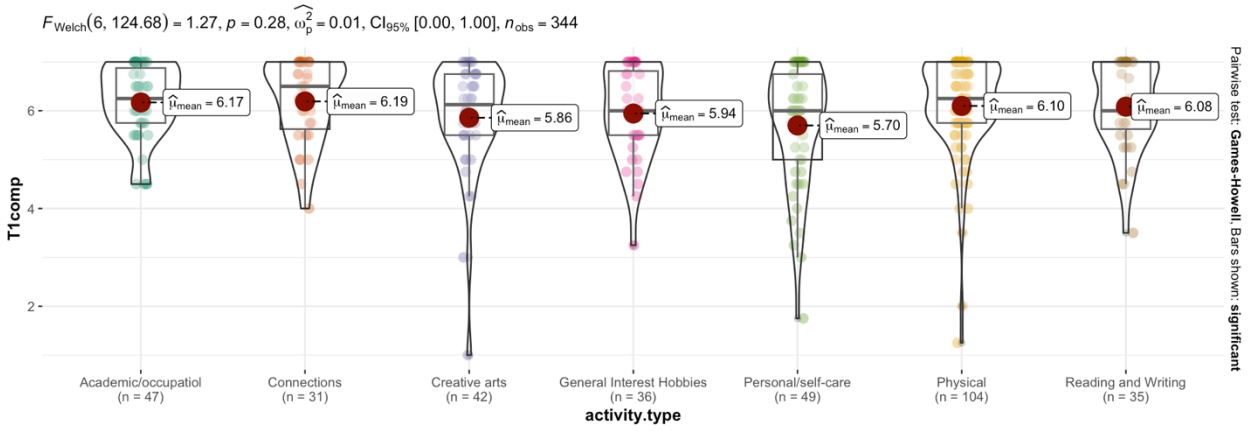


Figure 8.11

Level of Competence at Time 1 by Activity Type



Chapter 9

Discussion

The primary objective of my dissertation was to identify contexts for well-being-promoting processes (e.g., community assets, personal goals, daily activities). I explored the role of basic psychological need satisfaction (i.e., competence, autonomy, and relatedness) at the individual, activity, and community level. In particular, I tested the processes through which high achieving people experience well-being by engaging in activities associated with the pursual of ambitious goals. To achieve this objective, I used primary and archival data analyses grounded in open science principles, using cross-sectional (Chapter 2, 4, 6) and longitudinal (Chapter 8) quantitative survey designs.

Summary of Findings Across Four Studies

People feel happy when they feel a sense of autonomy (free time and financial security) and relatedness to other people (Chapter 2). This is true for both eudaimonic well-being and hedonic happiness, which are highly correlated (Chapters 4, 6, and 8), but not equally well-predicted (Chapter 2). Hedonic happiness (life satisfaction in Chapter 2, emotional well-being in Chapters 4 and 6) can be predicted by factors typically measured in well-being surveys, whereas eudaimonic well-being (life worth in Chapter 2 and 8, life purpose in Chapter 4) is a more specific, internal assessment related to life goals and purpose. The factors that generally predict well-being are similarly important for both life satisfaction and life worth, just not necessarily to the same degree for everyone (Chapter 2). When people feel that their activities in everyday life provides a sense of autonomy, control, likelihood of success, progress, absorption, low difficulty, and low challenge, they tend to report more hedonic happiness (enjoyment in Chapter 6). Digging deeper into the role of personality, I

found that high achieving people tend to experience hedonic happiness (Chapter 4, 8), eudaimonic well-being (Chapter 4, 8), and feelings of competence (Chapters 4, 6, 8), particularly when they satisfy their basic psychological needs through activities such as pursuing academic excellence or learning a new skill (Chapter 4).

Measurement and Methodological Nuances

Units of Analysis in Everyday Life: Activities and Projects

With personal projects (Chapters 4, 6), I was able to capture goals related to ordinary, everyday pursuits (e.g., maintaining or improving one's home) and to eudaimonic motives (e.g., learning new skills and broadening one's horizons). With personally expressive activities (Chapter 8), I learned more about people's specific behaviours and actions embedded in 'being themselves.' In fact, many people reported personally expressive activities related to reading and writing (Figure A2), which are typically non-linear endeavors (writing a dissertation is an inherently iterative and sometimes circular process). Interestingly, reading and writing activities were rated as being most flow-producing, which may be attributable more to the 'absorption' characteristic of flow (losing sense of time) as we know that people tend to enjoy highly-engaging activities (Chapter 6). Experimental findings have also highlighted the role of writing in flow. Fink & Drake (2016) had participants write a haiku poem about nature or a negative topic or write in a narrative format about a neutral topic, over three consecutive days. Three weeks later, those who wrote narratively about a neutral topic reported decreased psychological ill-being (symptoms of anxiety and depression), and those who wrote poetry about nature or a negative life event reported increased creativity (Fink & Drake, 2016). In a similar experiment where participants wrote about their current life stressors or a neutral topic three times over three weeks (Floyd, 2003), only those who wrote expressive poetry reported experiencing flow. More specifically, while three sessions of narrative writing about

negative topics reduced ill-being, the same frequency of writing poetry about negative topics improved well-being (and increased feelings of flow). Previous meta-analytic research has shown that writing to express emotion has positive psychological benefits (Smyth, 1998), and a more recent positive activities intervention study showed that writing about one's best possible self increased positive affect and flow, but did not satisfy one's need for competence (Layous et al., 2013). However, even short-term experiences of positive emotions can contribute to the initiation of an upward spiral and associated increase in well-being (Fredrickson & Joiner, 2002).

People tend to enjoy activities they find inherently interesting, genuinely value, and consider important to them (Waterman, 1993). For students at a research-intensive university, reading and writing are likely embedded in their everyday lives. Students tended to consider academic achievement as their current key life project (Chapters 4, 6). This is particularly noteworthy, given that activities boost well-being when they are congruent with their personality strengths, such as achievement striving (Chapter 4). Attending a research-intensive university reflects a choice made by someone striving for achievement; thus, the sample in my final study may be uniquely positioned to experience positive psychological processes during reading and writing, attributable to the nature of their academic-focused lives. The positive psychology literature suggests that selecting and pursuing personally expressive activities is an effective route to increasing long-term well-being (Emmons & McCullough, 2003; Waterman, 1993). While I was able to predict more variance in eudaimonic well-being than hedonic happiness, I have shown that this well-being route may not happen via competence and flow (Chapter 8).

Aligning Positive Psychology Processes with Units of Analysis in Everyday Life

When measuring flow (Chapter 8), we used personally expressive activities as the unit of analysis. These everyday activities are the building block elements of broader goals or projects, but are not temporally extended in time. It may be more difficult to assess one's progress in a single

activity, such as 'being outside in nature' or 'feeding ducks' compared to evaluating progress in a project. Given that people tend to enjoy activities that they get absorbed in (Chapter 6), it was surprising that feelings of flow during personally expressive activities did not boost achievement strivers' well-being in the short or long term. However, when considering that personally expressive activities are characterized by high effort (intrinsically motivated) activities (Waterman, 2005), and that people tend to report enjoying activities that are low difficulty (Chapter 6), perhaps flow is not the positive psychological process that is most powerful in boosting well-being for this type of person. While flow did directly predict eudaimonic well-being (life worth, Chapter 8), the pathway is not yet clear. Given that flow is facilitated by conditions of unambiguous and immediate feedback of progress, reminiscent of the factors contributing to project enjoyment (Chapter 6; perceptions of progress and likelihood of success), perhaps the nature of people's activities did not offer this feedback structure. For example, people described key projects in their life ranging from household improvement (e.g., renovating or remodeling) to skill development (e.g., learning an instrument or new language). The nature of these types of projects might offer feedback structures that provide flow-facilitating conditions; a person generally knows when they have made progress on putting together their catio or learned to play a new song on the fiddle but activities such as 'being outside in nature' or 'feeding ducks' lack feedback structures which promote flow. The measurement of flow may have been better suited to people's key life projects (Chapter 4 and 6) rather than personally expressive activities (Chapter 8), because project or goal pursual is temporal in nature and it requires the organization of one's efforts and actions over time to achieve an outcome.

Happy Achievement Strivers or Happy People with High Standards?

People with high personal standards strive for perfection to a degree further than people high in achievement striving (Gaudreau, 2019). Someone with high personal standards but who allows some room to make mistakes (low in discrepancies) is considered an adaptive perfectionist

(Stoeber et al., 2006) and generally reports high hedonic (Chan, 2012) and eudaimonic well-being (Rice et al., 2019). The construct overlap of conscientiousness and personal standards reflects a strong meta-analytic correlation (r = .49; Smith et al., 2019); accordingly, a debate in the personality and well-being literature is if personal standards reflects adaptive perfectionism, or if high personal standards is a healthy dimension of conscientiousness (similar to achievement striving). By using the Almost Perfect Scale Revised (APS-R; Rice & Ashby, 2007), I was able to incorporate all three constructs (personal standards, discrepancies, and achievement striving) into my models and disentangle the conceptual overlap (Chapter 4). This enabled me to show that while achievement striving was correlated with all three basic psychological needs (most strongly with competence), personal standards were more strongly correlated to each. In fact, while controlling for achievement striving and discrepancies, personal standards predicted well-being more consistently (through each basic psychological need) than achievement striving! I showed that both personal standards and achievement striving were indirectly related to higher well-being and argue that competence may be 'so good for' ambitious people to the degree that the relationship holds for various types of well-being (Chapter 4). While achievement striving indirectly predicted well-being through competence, only personal standards were able to consistently predict well-being through the two remaining basic psychological needs. That is, when the dimension of well-being was domain specific (vs. global), personal standards were more predictive of well-being than achievement striving, through both autonomy and relatedness (Chapter 4). These findings provide some counter-evidence to the contention that personal standards perfectionism is exclusively maladaptive (and 'bad for you'), while providing support for the contention that high personal standards is not simply synonymous with achievement striving.

Is Hedonic Happiness More Suited to Positive Psychological Intervention Than Eudaimonic Well-Being?

My survey design in Chapter 8 included surveys 4 months apart and this lag might have been too long to assess change in well-being longitudinally. By definition, hedonic happiness is more malleable on a day-to-day level (as an emotional state), but sustainable changes in eudaimonic well-being are likely more challenging to induce and to detect. While positive psychology intervention studies have found evidence of happiness boosts with lags of one day (Jose et al., 2012; Sheldon & Niemiec, 2006; Steger et al., 2008), this is more difficult to find with eudaimonic well-being. The simple reason may be that eudaimonia is characteristically more enduring than hedonic happiness, given the long-term emphasis on developing competencies, strengthening personal resources, and striving for future goals (Joshanloo et al., 2020), as opposed to immediate gratification and feeling good in the moment. Purposefully trying to improve one's current level of hedonic happiness may work as a "pick me up" but lacking in sustainability. Even meta-analytic research on the effectiveness of positive psychology interventions has shown that interventions focused solely on boosting hedonic happiness tend to be temporary (van Zyl & Rothmann, 2014). That is, these efforts may work for a while, but the effects do not persist. For example, Huta and Ryan (2009) found that people who participated in a positive psychological intervention focused on boosting hedonic happiness reaped more well-being benefits in the short-term, while those in a eudaimonic-focused intervention reported higher well-being in the long-term (3-months). This suggests eudaimonia may increase a person's baseline capacity for positive experiences over time (Huta & Ryan, 2009), and repeated engagement in positive activities can build psychological resources which foster growth experiences (Fredrickson, 2001). To address the critique of positive psychology intervention sustainability, two models have been proposed, which I will discuss next.

The Hedonic Adaptation Prevention Model

The Hedonic Adaptation Prevention model (HAP; Sheldon & Lyubomirsky, 2012) was developed by the same authors of the SHM (Lyubomirsky et al., 2005). The HAP argues that engagement in intentional activity (e.g., positive activities) can temporarily boost hedonic happiness, but require repeated engagement to maintain. This model informs my research, by highlighting that positive activity must be engaged in repeatedly, but remain challenging, interesting, and connecting enough to continue satisfying basic psychological needs.

Perhaps initial hedonic happiness boosts are a reliable platform for the promotion of positive functioning, by broadening attentional, behavioral, and cognitive abilities and building intellectual and social resources (Fredrickson, 1998). This would suggest that people can enjoy improved well-being by seeking a steady inflow of positive experiences that are conducive to need satisfaction (such as personal projects in Chapter 4), which then build a reservoir of positive psychological resources over time (akin to the broaden-and-build process proposed by Fredrickson (1998)). For example, people may purposefully engage in personally expressive activities that are enjoyable and they feel competent at (Chapter 8) which then become part of their key life projects (Chapter 4, 6) and contribute to on-going feelings of competence, autonomy, and relatedness). The idea is that deliberate attempts to boost hedonic happiness may be unsustainable because "trying to *feel* something" is too abstract (Sheldon et al., 2019, p. 921); however, people whose goals focus on eudaimonic functioning tend to experience higher well-being, relative to those whose goals were to boost hedonic happiness (Sheldon et al., 2019). Thus, trying to *do* something may be more effective, in part because of the specificity of the goal.

The Eudaimonic Activity Model

Engaging in activities directed toward goals that are inherently eudaimonic (e.g., generative, virtuous, expansive) tends to have the side effect of improving well-being (Sheldon, 2016, 2018; Sheldon et al., 2019). As a simple example, making someone else feel good can increase one's own happiness. In retrospective, experimental, and replication studies, Titova and Sheldon (2022) found that people experience well-being when "trying to make others happy" (p. 353). In fact, my second study showed that people experienced higher well-being through feeling connected to close others (Chapter 4). These findings support the main premise of the Eudaimonic Activity Model (EAM; see Figure 9.1), which states that directly working to improve one's own well-being is not as effective at improving well-being as pursuing eudaimonic activities (Sheldon, 2016, 2018; Sheldon et al., 2019). This shift in focus from self to others is not a quick shortcut to happiness, but flourishing tends to be a welcome side effect of eudaimonic activities. That is, lasting improvements to well-being is only achieved indirectly, through engagement in growth-promoting activities that satisfy basic psychological needs, thereby leading to greater well-being (Chapter 4; Sheldon, 2016, 2018; Sheldon et al., 2019). Perhaps when people have tunnel vision in the pursuit of happiness, they fail to savour and appreciate what they already have. Indeed, Sheldon & Lyubomirsky (2012) suggest cognitive reframing toward a resource-maximization framework, where well-being is first improved through savouring the present, before turning one's attention to the future.

Eudaimonia is concerned with a life well-lived while hedonic happiness is a subjective emotional state; this distinction suggests that living well entails eudaimonic motives and activities (Sheldon 2016, 2018). In fact, activities are a key component of many conceptualizations of eudaimonic well-being, such as worthwhile activities (White et al., 2017), personally expressive activities (Chapter 8; Waterman et al., 1993), and eudaimonic activities (Sheldon, 2016). Eudaimonia is inherently active and conative; it is a way of living rather than just feeling good. As Martela and

Sheldon (2019) point out, research consistently shows there are ways of 'living and doing' (p. 464) that are more strongly predictive of well-being. Some positive psychology researchers operationalize eudaimonic well-being and hedonic happiness in sequential terms; eudaimonia as a way of life (i.e., a predictor of well-being) and hedonia as an experience (i.e., the well-being outcome). For example, eudaimonia is commonly measured using behaviours and actions (Sheldon, 2016; Waterman, 1993) while hedonia is most often measured as life satisfaction (e.g., Vittersø 2003, 2004; Chapter 2, 8). A repercussion of this perspective is the difference in the happiness pursuit strategy of hedonically and eudaimonically motivated people. Those who are hedonically motivated are seeking the outcome of well-being at the end of a pursuit, such as feelings of being content and comfortable, while eudaimonically motivated people would focus on the quality of the activity itself (e.g., being virtuous; Fowers et al. 2010).

Basic psychological needs are likely positioned midway between eudaimonic motives/ activities and well-being, in that feelings of competence, autonomy, and relatedness mediate the effect of activities on well-being (Chapter 4; Ryan & Deci, 2017; Sheldon, 2018). This would mean that as long as a steady source of need satisfaction flows in, (i.e., continued eudaimonic activity engagement), then improved well-being can be sustained. Notably, the EAM considers need satisfaction as subjective experiences, not intentions or activities (Martela & Sheldon, 2019). The EAM may capitalize on shortcomings of the SHM (Lyubomirsky et al., 2005) and PAM (Lyubomirsky & Layous, 2013) as a broad objective of the EAM is to reconcile a lack of conceptual clarity in well-being research, including the construct of eudaimonic well-being and how it relates to (or conflicts with) hedonic happiness (Sheldon, 2016, 2019). Taken together, research suggests that prescriptions for enduring well-being are to focus on long-term personal growth and strengthening connections with others.

Positive Activity Prescriptions for Achievement Strivers

Much of the relationship between personality and well-being seems attributable to engagement in activities and pursual of goals. Simple positive activities, such as working on improving a new skill or reading books (Appendix C; Figure A3 and A4), are enjoyable when they provide a sense of autonomy, control, likelihood of success, progress, absorption, low difficulty, and low challenge (Chapter 6). High achieving people tend to enjoy well-being and feel competent (Chapter 4, 8); more specifically, their well-being is boosted when they engage in activities and pursue personal projects that satisfy their basic psychological need for competence (e.g., academic excellence; Chapter 4). Taken together, my research suggests that high achieving people will experience more joyful days when they feel competent, which is achievable through engaging in activities that are a) freely chosen, b) progress assessable, c) controllable and completable, d) not too difficult or challenging, and e) interesting enough to get absorbed in.

Lessons Learned

Balancing Richness with Pragmatism in Open-Ended Data Collection

While a seemingly simple way to gain insight into the activities of everyday life is to ask people open-ended questions about the goals they are pursuing and the activities they tend to do, any use of open-ended data brings unique challenges. When studying activities or other personal action constructs, I caution against vague wording such as "activities of importance" or "personally expressive activities" in the instructions to participants. Using clear, specific instructions with an example activity can improve data quality (demonstrated in Chapter 8). In the future, I suggest rigorous techniques for maintaining data integrity and quality when using open-ended questions.

Tempering Expectations of the Variation in Conscientious People's Daily Life

People tended to engage in activities that were inherently productive (e.g., physical fitness and academic achievement; Chapter 6; Figure A3) or relatively routine (e.g., household maintenance; Chapter 8). I was surprised to not find much variation in levels of competence across activity types (Chapter 8), then was reminded how conscientious people characteristically value schedules, order, and structure (Drasgow et al., 2012). The effectiveness of positive psychology intervention for improving achievement strivers' lasting well-being may be unique, in that conscientious people can utilize their preference for schedules and structure for planning novel experiences (e.g., travel). As variety in simple positive activities practiced daily predicts slower rates of hedonic adaptation to those experiences (Sheldon et al., 2013), conscientious people would be particularly active in mitigating the adaptation. Overall, people who tend to engage in a variety of new and interesting activities tend to reap the most well-being benefits in that their gradual regression to baseline well-being is slower. Including more varied personality trait measurements, such as openness to experience or extraversion, would likely have provided me with more rich data on activities and the link to well-being. Huta and Ryan (2009) have shown that hedonic happiness is more strongly linked to carefreeness than eudaimonic well-being, which suggests that a primary function of engaging in hedonically motivated activities is to alleviate everyday concerns and worries. This may be at tension with high achieving people, who are resourceful and industrious in finding ways to enjoy the mundane undertakings of everyday life (Gartland et al., 2014).

Limitations and Future Directions

My dissertation research reflects a quantitatively rigorous investigation into personality and well-being, based on analyses of primary and archival data through cross-sectional (Chapter 2, 4, 6) and longitudinal (Chapter 8) survey design. By incorporating open science principles into each study,

I hope to play my part in strengthening the reproducibility and credibility of positive psychology. A consistent finding through my dissertation studies is that positive psychological functioning (both hedonic happiness and eudaimonic well-being) is influenced by individual differences (Chapter 4, 6, and 8), the settings in which people organize their daily life (e.g., activities, goals, community; Chapter 2, 4, 6, and 8), and a combination of the two (achievement strivers tend to feel happy and competent; Chapter 4 and 8). I tested particular pathways using various measures of personality and well-being with various strengths and limitations.

Well-Being: An Outcome to Achieve or an Experience to Enjoy?

This thesis is based on data analytic techniques assessing the correlates and predictors of higher well-being. I appreciate the systems perspective of well-being, which would consider well-being as an *experience* of the correlates and predictors (e.g., sense of community, good physical health), than an *outcome* to be achieved. However, assessing socio-ecological influences on well-being (i.e., personality, activity, and community factors) requires empirical investigation of which factors influence (i.e., strengthen) well-being. To do this, I approached well-being as positive psychological functioning (e.g., zest for life, life satisfaction, life worthwhileness, life purpose) which can be strengthened by the presence and strength of socio-ecological factors (e.g., sense of community, good physical health). A complementary future direction would be to conduct network analysis on the socio-ecological factors and well-being, in order to identify patterns of the personality, activity, and community factors' influence on well-being.

Methodological Limitations

The cross-sectional multiple regression model utilized in my first study (Chapter 2) did not account for potentially complex interactions, indirect effects, and causal relationships among variables. My variable selection process in an existing QoL survey (Chapter 2) also means I may have

neglected factors that are uniquely important to eudaimonic well-being, which are typically not measured in community surveys (e.g., hope, generativity). While I can describe which variables predict the most variance in eudaimonic and hedonic well-being, I was unable to test the mechanisms behind the correlations. Nonetheless, I was able to identify which factors matter *most* for well-being, not just *if* it matters. I began my dissertation research in the midst of a global pandemic, which gave me limited opportunity to recruit representative participants from the general population. To reach target sample sizes in my primary data collection (Chapter 4, 6, 8), I also drew participants from undergraduate participant pools. These participant pools are relatively homogenous in demographic characteristics, which may limit the generalizability of my findings. Because the data in Chapter 4 and 6 were collected during the pandemic, characterized by a lockdown on all social contact, participants may have been feeling the need for close social contact at the time of the survey, and exaggerated their report of how enjoyable social connections tends to be. One of the main features of my dissertation was collecting open-ended data on people's everyday life (personal projects in Chapter 4 and 6; personally expressive activities in Chapter 8). To reduce participant burden, I collected less information than the original measures do (3 personal projects, 1 personally expressive activity). The consequence is that I collected information on only essential, key projects and activities in major life domains which could be overly general and not as unique as a personality psychologist would hope. This restricted the comprehensiveness of the information about people's day-to-day lives. When testing the personality-driven pathway to well-being in my longitudinal study (Chapter 8), the level of missing data meant I was not able to clarify the mechanistic pathway underlying achievement strivers' well-being boosts through engagement in activities. My use of wording such as "activities of importance" in the survey question to participants were unclear to some participants which created data quality issues in addition to missing data.

Methodological Strengths

To begin my dissertation research, I was privileged with access to the largest single non-government well-being dataset in North America (Engage Nova Scotia's 2019 Quality of Life survey). I used a more sophisticated and informative statistical technique than traditional regression weights (i.e., relative importance effect sizes using the lmg method) used in survey research (Chapter 2), which was particularly well-suited for such a large survey, because it correctly partitions variance in the presence of large correlations among the independent variables. In my primary data collection studies, I utilized open data and methods (Chapters 4, 6, and 8), as well as multiple measures of achievement-related personality traits and positive psychological functioning (Chapter 4), which helped me move beyond eudaimonic and hedonic well-being. Through the combination of quantitative statistical techniques and content coding of open-ended data (Chapter 6, 8), I was able to qualitatively describe 'the things that people do which make them happy.' In particular, the types of life activities pursed and the qualities that make these projects enjoyable (i.e., a positive activity; Chapter 6) and the personally expressive activities that provide a sense of competence and well-being (Chapter 8). Though many of the effects in my longitudinal study (Chapter 8) were non-significant, I was still able to extract information from the confidence intervals of the relationships between my main constructs of interests (achievement striving, competence, flow, and well-being). Through a series of power simulations, I ruled out indirect effects derived from bivariate correlations of $r = 0.25$ cross-sectionally. This indicated there are not medium to large effects in the population, but my data were not informative for any smaller effect sizes.

Future Directions

The main future direction based on my dissertation research is to continue investigating the pathway from personality to well-being through everyday life. Given my focus on achievement

striving and competence, I aim to identify alternative mechanistic pathways from achievement striving to well-being in order to elucidate how, when, and why achievement strivers feel happy, beyond simple competence need satisfaction. Assessing the role of the two remaining basic psychological needs in well-being (relatedness and autonomy) and the remaining four Big Five personality factors (openness, extraversion, agreeableness, neuroticism) would paint a fuller picture of the relationship between personality and well-being. Openness to experience is particularly appealing to me for future research on basic psychological need satisfaction and well-being, given the new direction in the positive psychological literature on psychological richness (Oishi et al., 2019). Novelty/variety has been proposed as a candidate basic psychological need (Bagheri & Milyavskaya, 2020; Kashdan & Silvia, 2009; Okabe-Miyamoto et al., 2023) and is an interesting future avenue for testing personality-specific premises of the theoretical models that framed my dissertation.

The idea of a 'good life' has traditionally been thought of as one filled with happy, pleasurable moments of comfort (hedonic), or one filled with meaningful dedication to personally valued goals (eudaimonic). This dichotomy divides and dominates the positive psychological literature on the good life, which limits our knowledge on what a good life can look like, by overlooking many lives that do not fit neatly within it. More recently, other ideas of a good life have emerged, that are building knowledge on the ways in which people pursue well-being based on the type of life they value. Moving beyond the eudaimonic–hedonic divide, another pathway to well-being is through pursuing a psychologically rich life; "one characterized by a variety of interesting and perspective-changing experiences" (Oishi & Westgate, 2021, p. 1). An exciting avenue for my research is to identify the individual and contextual factors that characterize the psychologically rich life in an everyday context.

The Psychologically Rich Life. A newly identified pathway to well-being is characterized by high mental engagement, varied intense emotions, and a wide range of interesting experiences (Besser & Oishi, 2020). This life, a pathway to "the good life," contains elements of two previously written about pathways to the good life (a meaningful life and a happy life). In the psychologically rich life, experiences include those that are happy (hedonic), meaningful (eudaimonic), and sometimes neither, but they are never boring (Besser & Oishi, 2020). Oishi and Westgate (2021) argue it is beneficial to treat the pathways as interrelated but distinct aspects of a good life; although some people may be higher on meaning than pleasure, the pathways represent components or dimensions of the good life, rather than independent types of life. In fact, some people may be lucky enough to have a pleasurable, meaningful, and rich life. Highlighting the strengths and values of someone leading a psychologically rich life could help identify which route is most "promising" for individuals seeking to boost their well-being.

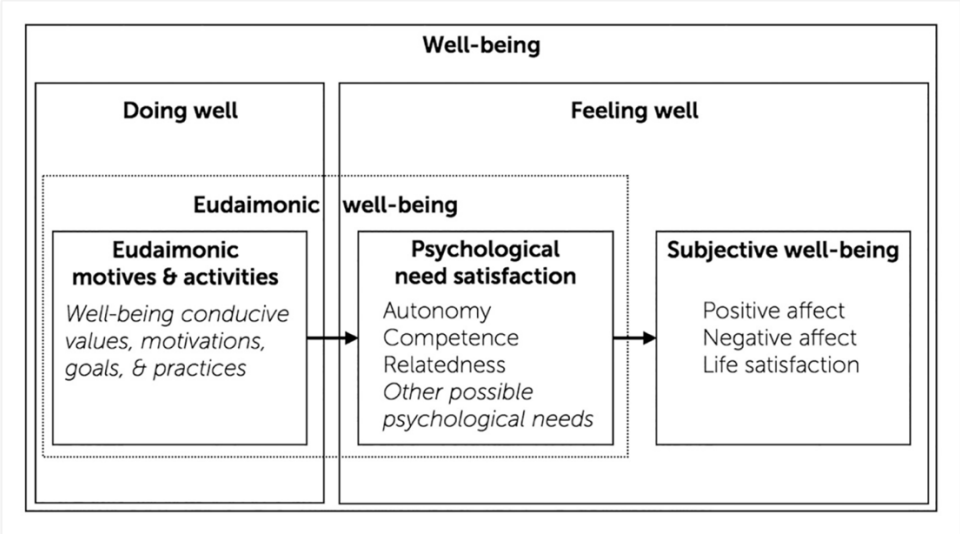
Concluding Thoughts on Well-Being

Overall, hedonic-happiness and eudaimonic well-being each play a part in the complete picture of well-being, and their combination may be most fruitful for living a full life. The varied benefits of engaging in hedonic and eudaimonic activities (i.e., personal projects and personally expressive activities) highlight the importance of measuring well-being more broadly than it often is. Had I measured well-being using the most common and simple way (i.e., life satisfaction), I may have concluded that time adequacy is more important for well-being than satisfaction with the natural environment (Chapter 2), that achievement strivers' do not experience higher well-being though feelings of autonomy (Chapter 4), and that competence is only weakly related to concurrent well-being and not future well-being (Chapter 8). Further, had I measured multiple dimensions of well-being in Chapter 8 as I did in Chapter 4 and 6 (e.g., passion, zest for life), I expect that the hypothesized mechanistic pathway would have been supported. In particular, I would expect that

achievement strivers' would experience varied well-being benefits (such as feeling passionate and having zest for life) through competence and flow. Through my research, I learned that basic psychological needs are key to human flourishing; as they are relevant to both hedonic and eudaimonic activities, need satisfaction deserves a spotlight in the positive psychology literature.

Figure 9.1

The Eudaimonic Activity Model



Note. This figure is from Martela and Sheldon (2019). Permission to re-use this figure was granted by SAGE Publications.

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Appendix A: Survey Questionnaires

Study 1 (Chapter 2) Survey variables requested from Engage NS

Variable name	**Variable**
VOLUNTEER	Volunteered in past year
RELATVS	Number of close relatives
FRIENDS	Number of close friends
NEIGHBRS	Number of neighbours you know well enough to ask a favour
BELONGING	Sense of belonging to community
LVG_H1	People in this community are available to give help if somebody needs it
LVG_S1	I have good friends in this community
LVG_N1	This community provides opportunities for me to do a lot of different things
LVG_H2	If I had a problem, few people in this community would try to help me
LVG_SI1	I often feel that I lack companionship [Loneliness 1]
LVG_S2	I feel at ease with the people in this community
LVG_N2	If I need help, this community has many excellent services to meet my needs
LVG_H3	In this community, people are not willing to help those in need
LVG_SI2	I often feel left out [Loneliness 2]
LVG_S3	People are sociable here
LVG_N3	In this community there is never much to do
LVG_SI3	I often feel isolated from others in the community [Loneliness 3]
LVG_H4	If I had an emergency, people I do not know would be willing to help me
LVG_S4	It is difficult for me to connect with the people in this community
LVG_N4	In this community I have few opportunities to satisfy my needs
LVG_V1	I regularly stop and talk to people in my neighbourhood
SAFE_NBR	How safe from crime walking alone after dark in: your neighbourhood
PHYSHLTH	Self-assessed physical health
MNTLHLTH	Self-assessed mental health
HB_EXERCISE	In the past week ... I regularly engaged in good quality exercise
POLICY	Have the programs/services of the local government made you better off?
WORKPAY	Do you work for pay?[1]
EXP_BILL	How often in past year: I could not pay my bills on time (e.g., water, power, phone, credit card)
EXP_HOME	How often in past year: I could not pay my mortgage or rent on time
EXP_FOOD	How often in past year: I ate less because there was not enough food or money for food
EXP_NFOOD	How often in past year: I could not afford to purchase nutritious foods
EXP_FOODBK	How often in past year: I use a local food bank
EXP_TRANS	How often in past year: I could not afford to pay for transportation to get to where I needed
EXP_WANT	How often in past year: I did not have enough money to buy the things I *wanted*
EXP_NEED	How often in the past year: I did not have enough money to buy the things I *needed*
TIMEREST	Adequate time: To get enough sleep/rest
TIMESELF	Adequate time: To be yourself
TIMESOC	Adequate time: To socialize

TIMEPHYS	Adequate time: To keep in shape
TIMEMEAL	Adequate time: To prepare or eat healthy meals
TIMECOMM	Adequate time: To participate in or be active in the community
TIMENURT	Adequate time: To nurture your spiritual side
TIMECHOR	Adequate time: To complete chores or errands
TIMEKIDS	Adequate time: To be with the children you live with
TIMESPOU	Adequate time: To be with your partner or spouse
TIMEFAML	Adequate time: To be together with your family
TIMERELA	Adequate time: To form and sustain serious relationships
TIMECREA	Adequate time: To nurture your creative side
LIFEWRTH	Overall, to what extent do you feel things you do in your life are worthwhile? [eudaimonic]
LIFESAT	How satisfied are you with your life in general? [hedonic]
GENDER	What is your gender?
AGE	Current age in years
MARSTAT	Marital status
EDUCAT	Highest level of education completed
INCOME	Total household income before taxes from all sources last year
BORN_CAN	Were you born in Canada?
YEARS_CAN	Total years living in Canada
DISABILITY	Living with a mental/physical disability or chronic illness
PARTHAVE	Currently have a partner
KIDS_U5	Number of children under 5 years of age
KIDS_5TO12	Number of children 5 to 12 years of age
KIDS_13TO18	Number of children 13 to 18 years of age
KIDS_OVER18	Number of children over 18 years of age
SOCIAL_CLIMATE	Social climate and bonds dimension within sense of community
SOC_HELP	Help in case of need dimension within sense of community
SOC_NEEDS	Needs fulfillment dimension within sense of community
OVERALL_SOC	Overall measure of sense of community
SOCIAL_ISO	Feelings of social isolation (three items embedded within the sense of community scale)

Study 2 and 3 (Chapter 4 and 6) Survey

Baseline Demographics

1. Your age: _____ years
2. Your gender: _____
3. Your ethnicity (e.g., Asian, Caucasian/White, First Nations, etc.): _____
4. Your occupational status: Part-time ____ Full-time ___ Student: ____ Unemployed: ____

Achievement Striving facet scales

(Items 1-10: Costa et al., 1991)

Enter the number from the scale below that best describes how typical or characteristic each of the items is of ***you***, putting the number next to the item. You should make your ratings in terms of how much you agree or disagree with the statement as a description of yourself.

1 strongly disagree 2 somewhat disagree 3 disagree 4 neither agree nor disagree 5 agree 6 somewhat agree 7 strongly agree

1. Go straight for the goal.
2. Work hard.
3. Turn plans into actions.
4. Plunge into tasks with all my heart.
5. Do more than what's expected of me.
6. Set high standards for myself and others.
7. Demand quality.
8. Am not highly motivated to succeed.
9. Do just enough work to get by.
10. Put little time and effort into my work

Modified Basic Psychology Need Satisfaction Scale (Hadden & Smith, 2019)

Enter the number from the scale below to identify extent to which you perceived each basic need was satisfied **in the past week.**

Not at all true Very true

1. I felt that my choices were based on my own interests and values
2. I felt that my choices expressed my 'true self'
3. I felt very capable in what I did
4. I felt that I was taking on and mastering hard challenges
5. I felt close and connected with other people
6. I felt a strong sense of intimacy with the people I spent time with

Autonomy subscale: items 1 and 2
Competence subscale: items 3 and 4
Relatedness subscale: items 5 and 6

MHC – SF (Keyes, 2007)

During the past month, how often did you feel the following ways:

0 never 1 once or twice 2 about once a week 3 a couple times a week 4 almost every day 5 every day

1. Happy
2. Interested in life
3. Satisfied with life
4. That you had something important to contribute to society
5. That you belonged to a community
6. That our society is becoming a better place for all people
7. That people are basically good
8. That the way our society works made sense to you
9. That you liked most parts of your personality
10. Good at managing the responsibilities of your daily life
11. That you had warm and trusting relationships with others
12. That you had experiences that challenged you to grow and become a better person
13. That your life has a sense of direction or meaning to it
14. Confident to think or express your own ideas and opinions

Items 1-3: emotional well-being
Items 4-8: social well-being
Items 9 – 14: psychological well-being scale

Almost Perfect Scale-Revised (Slaney et al., 1996)

The following items are designed to measure attitudes people have toward themselves, their performance, and toward others. There are no right or wrong answers. Please respond to all of the items. Use your first impression and do not spend too much time on individual items in responding. Respond to each of the items using the scale below to describe your degree of agreement with each item.

1 strongly disagree 2 somewhat disagree 3 disagree 4 neither agree nor disagree 5 agree 6 somewhat agree 7 strongly agree

1. I have high standards for my performance at work or at school.
2. I am an orderly person.
3. I often feel frustrated because I can't meet my goals.
4. Neatness is important to me.
5. If you don't expect much out of yourself, you will never succeed.
6. My best just never seems to be good enough for me.
7. I think things should be put away in their place
8. I have high expectations for myself.
9. I rarely live up to my high standards.
10. I like to always be organized and disciplined.
11. Doing my best never seems to be enough.
12. I set very high standards for myself.
13. I am never satisfied with my accomplishments.
14. I expect the best from myself.
15. I often worry about not measuring up to my own expectations.
16. My performance rarely measures up to my standards.
17. I am not satisfied even when I know I have done my best.
18. I try to do my best at everything I do.
19. I am seldom able to meet my own high standards of performance.
20. I am hardly ever satisfied with my performance.
21. I hardly ever feel that what I've done is good enough.
22. I have a strong need to strive for excellence.
23. I often feel disappointment after completing a task because I know I could have done better.

Standards = 1, 5, 8, 12, 14, 18, 22,
Order = 2, 4, 7, 10,
Discrepancy = 3, 6, 9, 11, 13, 15, 16, 17, 19, 20, 21, 23,

Passion (Sigmundsson et al., 2020)

Please rate your agreement with the following statements about your passion toward achievement.

1 not like me at all 2 not much like me 3 not like or dislike me 4 a little like me 5 very much like me

1. I have an area/theme/skill I am really passionate about
2. I would like to use a lot of time to become good in that area/theme/skill
3. I think I could be an expert in one area/theme/skill
4. I have passion enough to become very good in the area/theme/skill I like
5. I work hard enough to fulfill my goals
6. I have a burning passion for some areas/theme/skills
7. I use lot of time on the projects I like
8. My passion is important for me

Valued Living Questionnaire (Wilson et al., 2010)

Below are areas of life that are valued by some people. This questionnaire will help clarify your own quality-of-life in each of these areas. One aspect of quality-of-life involves the importance you put on different areas of living. Rate the importance of each area (by circling a number) on a scale of 1-10. A "1" means that area is *not at all important*. A "10" means that area is *very important*. Not everyone will value all of these areas, or value all areas the same. Rate each area according to **your own personal sense of importance**.

Area:	**not at all important**									**extremely important**
1) Family (other than marriage or parenting)	1	2	3	4	5	6	7	8	9	10
2) Marriage/couples/ intimate relationships	1	2	3	4	5	6	7	8	9	10
3) Parenting	1	2	3	4	5	6	7	8	9	10
4) Friends/social life	1	2	3	4	5	6	7	8	9	10
5) Work	1	2	3	4	5	6	7	8	9	10
6) Education/training	1	2	3	4	5	6	7	8	9	10
7) Recreation/fun	1	2	3	4	5	6	7	8	9	10
8) Meaning & purpose in life	1	2	3	4	5	6	7	8	9	10
9) Citizenship/ Community Life	1	2	3	4	5	6	7	8	9	10
10) Physical self-care	1	2	3	4	5	6	7	8	9	10

In this section, please give a rating of how **consistent** your actions have been with each of your values. Please note that this is **not** asking about your ideal in each area, **nor** what others think of you. Everyone does better in some areas than in others. People also do better at some times than at others. **Please just indicate how you think you have been doing during the past week.** Rate each area (by circling a number) on a scale of 1-10. A 1 means that your actions have been *completely inconsistent with your value*. A 10 means that your actions have been *completely consistent with your value*.

During the past week…

Area:	**not at all consistent with my value**									**completely consistent with my value**
1) Family (other than marriage or parenting)	1	2	3	4	5	6	7	8	9	10
2) Marriage/couples/ intimate relationships	1	2	3	4	5	6	7	8	9	10
3) Parenting	1	2	3	4	5	6	7	8	9	10
4) Friends/social life	1	2	3	4	5	6	7	8	9	10
5) Work	1	2	3	4	5	6	7	8	9	10
6) Education/training	1	2	3	4	5	6	7	8	9	10
7) Recreation/fun	1	2	3	4	5	6	7	8	9	10
8) Meaning & purpose in life	1	2	3	4	5	6	7	8	9	10
9) Citizenship/ Community Life	1	2	3	4	5	6	7	8	9	10
10) Physical self-care	1	2	3	4	5	6	7	8	9	10

Zest for Life scale (George et al., 2016)

Please answer the following questions about yourself by indicating the extent of your agreement using the following scale:
1 strongly disagree 2 somewhat disagree 3 disagree 4 neither agree nor disagree 5 agree 6 somewhat agree 7 strongly agree

1. I used to think of life as 'half full,' now it feels more like 'half empty'
2. I feel less alive than I used to
3. Life seems to hold less for me than it used to
4. Life feels more full as time moves on
5. I never used to, but now I sometimes think 'why bother'
6. Life has become a drag
7. I am embracing life
8. I wake up in the morning and look forward to what life has in store for me
9. I strive to participate fully in life, and not just view it from the sidelines
10. I look forward to each new day
11. I try to enjoy life no matter what
12. I am looking forward to all that life has to offer

Life Engagement Test

Please answer the following questions about yourself by indicating the extent of your agreement using the following scale:
1 strongly disagree 2 disagree 3 neither agree nor disagree 4 agree 5 strongly agree

1. There is not enough purpose in my life
2. To me, the things I do are all worthwhile
3. Most of what I do seems trivial and unimportant to me
4. I value my activities a lot
5. I don't care very much about the things I do
6. I have lots of reasons for living

Personal Project Analysis (Little, 1983)

Step 1: Project Elicitation

We are interested in studying the kinds of activities and concerns that people have over the course of their lives. We call these *personal projects.* All of us have a number of personal projects at any given time that we think about, plan for, carry out and sometimes (though not always) complete.

Some projects may be focused on achievement (*"Getting my degree"*) others on the process (*"Enjoying a night out with friends"*); they may be things we choose to do or things we have to do; they may be things we are working towards or things we are trying to avoid. Projects may be related to any aspect of your daily life, university, work, home, leisure and community, among others. Please think of projects in this broad way.

We are also interested in finding out what you think and how you feel about these personal projects and activities, how important or stressful they are, and so on.

To start, please take a few minutes and write down on the following page(s) 3-5 personal projects and activities you can that you are currently engaged in or considering -- remember these need not be formal projects or even important ones -- we would prefer you to give us more of the everyday kinds of activities or concerns that characterize your life at present.

Step 2: Project Rating Matrices and Dimension Definitions

Now select 5 projects from your list that you feel are important to you or typical of your life and copy them onto the "What do you think about what you are doing?" matrix on the next couple of pages. If you have many more than 10 such projects, choose those that you expect to be actively working on in the next couple of months.

Once you have written in all 5 projects you may begin to rate each one from 0 - 10 on the series of dimensions listed along the top of the page. If you feel a dimension is not relevant to a project, you may put an X in the space instead of a numerical rating, but please try to rate each project on all dimensions wherever possible.

In the following section of this questionnaire is a list of these dimensions and a more detailed explanation of what each one means.

Project Dimension Definitions

1. Importance

How important is this project to you?
(Use 10 if you consider it to be very important, and 0 if it is not at all important)

2. Difficulty

How difficult do you find it to carry out each project?
(Use 10 for a project which is extremely difficult to carry out, and 0 for one that is not difficult at all.)

3. Visibility

How visible is this project to others that are close to you?
(Use 10 for a project which is very visible to those around you, and 0 for a project which is not at all visible to those around you).

4. Control

How much do you feel you are in control of this project?
(Use 10 if you feel completely in control of the project, and 0 if you feel you have absolutely no control over the project.)

5. Responsibility

How responsible are you for carrying out this project?
(Use 0 is you do not feel any responsibility for making progress in this project, and 10 if you feel entirely responsible for the project.)

6. Time Adequacy

How adequate is the amount of time you spend working on this project?
(Use 10 if you feel the amount of time is perfectly adequate, and 0 if you feel that the amount of time you spend working on the project is not at all adequate.)

7. Outcome (Likelihood of Success)

How successful do you believe this project will be?
(Use 10 if you expect the project to be entirely successful, and 0 if you think the project will turn out to be a total failure.)

8. Self-Identity

All of us have things we do that we feel are typical or truly expressive of us. These things can be thought of as our "trade marks". For example, some people engage in sports every chance they get, others prefer to read, others prefer to socialize. Think of what your own personal "trade marks" are, and then rate this project on the extent to which it is typical of you.
(Use 10 if a project is very typical of you, and 0 if it is not typical at all.)

9. Others' View of Importance

How important is this project seen to be by those people who are close to you?
(Use 10 if a project is seen by others as very important, and 0 if it is seen as not important at all.)

10. Value Congruency

To what extent is each project consistent with the values that guide your life?
(Use 10 if a project is totally consistent with your values, and 0 if a project is totally at odds with them)

11. Progress

How successful have you been in this project so far?
(Use 10 to indicate that you have been very successful and 0 to indicate that you have had no success at all.)

12. Challenge

How challenging do you find this project?
(Use 10 if it is very challenging, perhaps more than you can handle, and 0 if it is not at all challenging, indeed you find it almost boring).

13. Absorption

To what extent do you become engrossed or deeply involved in a project
(Use 10 if you generally get absorbed in an activity, and 0 if you tend to be uninvolved when doing it).

14. Support

To what extent do you feel each project is supported by other people? Support may come in different forms, e.g. emotional (encouragement, approval), financial (money, material possessions) or practical (active assistance).
(Use 10 if you feel other people support the project a lot, and 0 if there is no support at all).

15. Competence

To what extent do you feel competent to carry out this project?
(Use 10 if you feel completely competent to carry out the project, and 0 if you do not feel competent to carry it out).

16. Autonomy

How much is this project one which you feel you are pursuing autonomously, that is, you are engaged of your own free will in the project, not because anyone else wants you to do it.
(Use 10 if you are engaged in this project entirely of your own free will, and 0 if this project is one that you feel totally obliged to complete because of or for someone else)

17. Stage

Projects often go through several stages, which can be visualized along a time-line, such as:
0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
Using the scale on this page, rate each project's stage:

0 - 1	Awareness	The idea for the project has just come to you.
2	Transition	You have decided to proceed with the project.
3 - 4	Planning	You are planning it and obtaining whatever personal and material support it may require.
5	Transition	You have the project planned out and you are beginning to (or trying to) actively start the project.
6 - 7	Action	You are actively working on the project and trying to balance it with your other projects, resources and time commitments.
8	Transition	You are evaluating the project and your motivation to continue with it, or bring it to completion/disengage from it.
9 - 10	Completion	The project is coming to a close or has actually been completed or terminated.

18. Feelings

Using the matrix "How do you feel about what you are doing?" on the following pages, rate from 0 to 10 the extent to which you feel each emotion while engaged or thinking about each project. (Use 10 if you experience the emotion very strongly, and 0 if you don't feel it at all.)
In the Other Specific Feeling column you have the opportunity to write in any specific emotion that you feel characterizes your project, but may not have been mentioned.

Study 4 (Chapter 8) Survey
Pre-Consent Compensation Question

You will complete questionnaires twice, once today and another survey about 4 months later. You have one of two options for compensation. Please select which option you prefer:

( ) A $25 Amazon gift card ($10 for completing today's questionnaire, $15 for completing the second questionnaire).

( ) Bonus credit points for an eligible psychology class using the SONA system and an Amazon gift card (1.0 bonus points for completing today's questionnaire, $15 gift card for completing the second questionnaire).

To send the digital gift card and to get the link to the second questionnaire 4 months later, we need your email address. We will also use this email to send a reminder email to complete questionnaires. This email address will be deleted once we send you the $15 gift card after you complete the second questionnaire. Please type your email in below:

_____

To award credit points through the SONA system, we will need your Dalhousie Student ID (B00#). Please provide it below:

_____

Note: Piping will be used so only students who request bonus credit points will be asked to provide their student ID. Moreover, the wording for "Dalhousie netID" will be changed in the version provided to York students to be working applicable for what is needed in their system.

Demographic & Statistics Background Questions

1. Which level of education are you currently in?
   a. Undergraduate degree (BA/BSc/other)
   b. Graduate degree (MA/MSc/MPhil/other)
   c. Doctorate degree (PhD/other)

2. What is your current age?

   _____ (number entry)

3. What is your language?

   _____ (free-text)

4. What is your nationality?

   _____ (free-text)

5. What is your country of birth?

   _____ (free-text)

6. What is your employment status?

   _____ (free-text)

7. What is your sex assigned at birth?
a. Male
b. Female
c. Intersex
d. Prefer not to answer

8. What is your gender? Refers to current gender which may be different from sex assigned at birth and may be different from what is indicated on legal documents.
a. Man,
b. Woman,
c. Prefer not to answer
d. Other _____

9. Your university major (current or planned. If unknown, you can say "undecided"):
   _____ (free-text)

10. Which year of your university/college program are you currently in?

    a. 1st

b. 2nd

c. 3rd

d. 4th

e. 5th

f. 6th

g. 7th

h. 8th

i. 9th or more

j. Prefer not to answer

11. Have you ever **<u>previously</u>** taken and completed at least one university level statistics class? This includes university or college courses that primarily focus on material such as probability, z-scores, descriptive statistics, p-values, confidence intervals or other statistical concepts.

a. Yes
b. No
c. Prefer not to answer

12. How many different prior statistics classes have you taken? Please select form the dropdown list provided.

    A drop down list from 0 to 20+ and Prefer not to answer

13. Are you **<u>currently</u>** taking a university level class in statistics that you have not yet completed?

a. Yes
b. No
c. Prefer not to answer

Current Class's Course Code, University and GPA (WAVE 1)

1. What University are you currently attending?
a. Dalhousie University
b. York University

2. Which of the following courses are you currently registered in (LIST OF COURSE CODES AND INSTRUCTORS WILL BE PROVIDED AS A DROP-DOWN ONCE TIMETABLES FOR THE UPCOMING TEACHING TERMS ARE FINALIZED).

3. What is your current grade point average (GPA)? (numerical entry) ___
[STUDENTS WILL ALSO BE PROVIDED WITH A CURRENT LETTER GRADE TO GPA EQUIVALENCY TABLE AT THEIR UNIVERSITY

Current Class's Course Code, University and GPA (WAVE 2)

1. What University are you currently attending?
c. Dalhousie University
d. York University

2. Which of the following courses were you registered in last term? (LIST OF COURSE CODES AND INSTRUCTORS WILL BE PROVIDED AS A DROP-DOWN ONCE TIMETABLES FOR THE UPCOMING TEACHING TERMS ARE FINALIZED).

4. What was the final letter grade you received in your statistics class or classes last term?
[A LIST OF THE CLASSES CHOSEN IN QUESTION 2 ARE PROVIDED TO STUDENTS, AND THEY GIVE EACH CLASS A LETTER GRADE FROM F TO A+ OR ILL/INC]

4. What is your current grade point average (GPA)? (numerical entry) ___
[STUDENTS WILL ALSO BE PROVIDED WITH A CURRENT LETTER GRADE TO GPA EQUIVALENCY TABLE AT THEIR UNIVERSITY

Achievement Striving facet scale (Costa et al., 1991)

Enter the number from the scale below that best describes how typical or characteristic each of the items is of ***you***, putting the number next to the item. You should make your ratings in terms of how much you agree or disagree with the statement as a description of yourself.

1 strongly disagree 2 somewhat disagree 3 disagree 4 neither agree nor disagree 5 agree 6 somewhat agree 7 strongly agree

11. Go straight for the goal.
12. Work hard.
13. Turn plans into actions.
14. Plunge into tasks with all my heart.
15. Do more than what's expected of me.
16. Set high standards for myself and others.
17. Demand quality.
18. Am not highly motivated to succeed.
19. Do just enough work to get by.
20. Put little time and effort into my work

Perceived Competence Scale

If you wanted another person to know about who you are and what you are like as a person, what is an activity of importance to you that you would you describe?"

(1 not at all true) -- 2 -- 3 – (4 somewhat true) –5 -- 6 – (7 very true)

1. I feel confident in my ability to engage in this activity.
2. I am capable to engage in this activity.
3. I am able to achieve my goals in this activity.
4. I feel able to meet the challenge in this activity.

Flow (Absorption; Rheinberg et al., 2003)

If you wanted another person to know about who you are and what you are like as a person, what is one activity of importance to you that you would you describe?

1 strongly disagree 2 somewhat disagree 3 disagree 4 neither agree nor disagree 5 agree 6 somewhat agree 7 strongly agree

1. When I engage in this activity I feel just the right amount of challenge.
2. When I engage in this activity I do not notice time passing.
3. When I engage in this activity I am totally absorbed in what I am doing.
4. When I engage in this activity I am completely lost in thought.

Well-being

Thinking of your life in general, please rate your satisfaction and worthwhileness.

1. How satisfied are you with your life in general?
1 not at all 5 neither satisfying or unsatisfying 10 extremely

2. How worthwhile is your life in general?
1 not at all 5 neither worthy or unworthy 10 extremely

Appendix B: Supplemental Analyses From Chapters 6 and 8

Table A1

Results of Supplementary Linear Mixed Models with Quadratic Difficulty and Challenge Variables

Predictors	*Estimates*	*std. Error*	*CI*	*p*	*Estimates*	*std. Error*	*CI*	*p*
(Intercept)	4.75	0.43	3.91 – 5.60	**<0.001**	6.14	0.38	5.38 – 6.89	**<0.001**
challenge	0.96	0.14	0.68 – 1.25	**<0.001**				
challenge squared	-0.09	0.01	-0.11 – -0.06	**<0.001**				
difficulty					0.65	0.13	0.38 – 0.91	**<0.001**
difficulty squared					-0.07	0.01	-0.10 – -0.05	**<0.001**
Random Effects								
σ^2	5.03				4.76			
τ_{00}	3.01 $_{id}$				3.28 $_{id}$			
ICC	0.37				0.41			
N	303 $_{id}$				303 $_{id}$			
Observations	898				898			
Marginal / Conditional R^2	0.056 / 0.410				0.076 / 0.453			

Figure A1

Scatterplot Showing Relationship Between Personal Project Challenge and Enjoyment

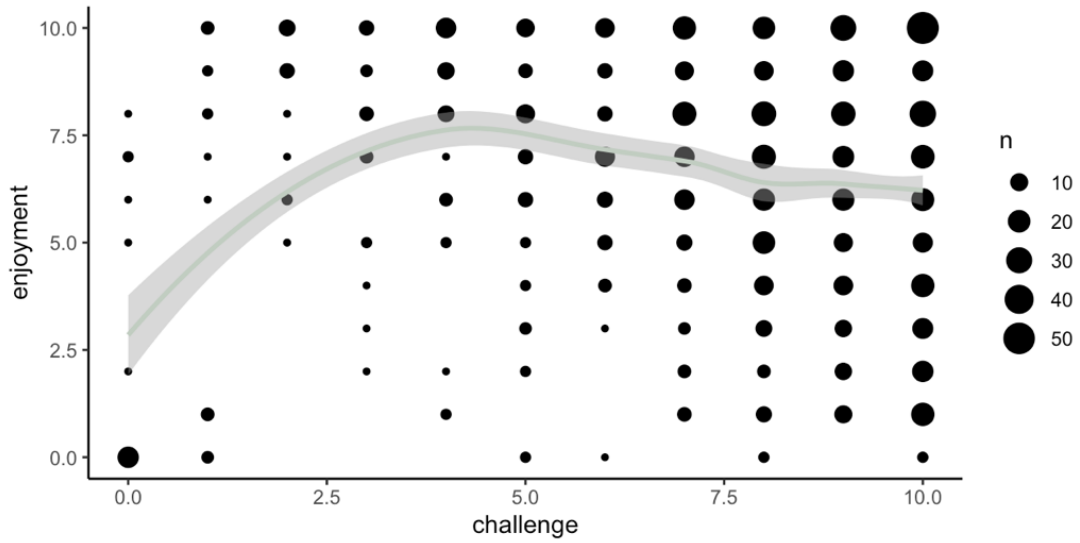

Figure A2

Scatterplot Showing Relationship Between Personal Project Difficulty and Enjoyment

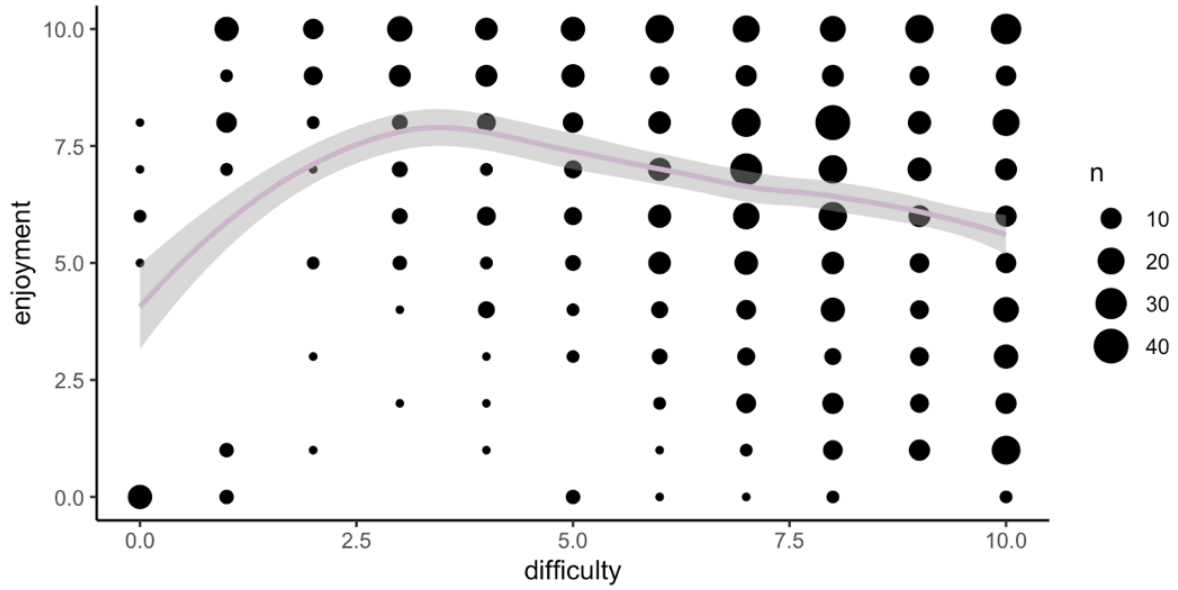

Table A2

Standardized Coefficients (Cross-Lagged Panel Model 1 SWL and Flow)

lhs	op	rhs	label	est.std	se	z	pvalue	ci.lower	ci.upper
T2swl	~	T1swl		.610	.059	10.295	0	.493	.726
T2swl	~	T1achstriv	adirect	.072	.056	1.289	.198	-.038	.182
T2swl	~	T1flow	b1	-.077	.057	-1.361	.174	-.189	.034
T2flow	~	T1flow		.440	.077	5.721	0	.289	.591
T2flow	~	T1achstriv	a1	.066	.066	1.001	.317	-.063	.195
T2achstriv	~	T1achstriv		.660	.052	12.596	0	.557	.762
T1swl	~~	T1flow		.113	.051	2.203	.028	.012	.213
T1swl	~~	T1achstriv		.294	.051	5.784	0	.194	.393
T1achstriv	~~	T1flow		.077	.062	1.235	.217	-.045	.198
T2swl	~~	T2flow		.094	.116	.808	.419	-.134	.321
T2swl	~~	T2achstriv		.183	.108	1.689	.091	-.029	.394
T2flow	~~	T2achstriv		.136	.115	1.177	.239	-.090	.362
T2swl	~~	T2swl		.603	.068	8.837	0	.469	.737
T2flow	~~	T2flow		.797	.072	11.071	0	.656	.938
T2achstriv	~~	T2achstriv		.565	.069	8.181	0	.430	.700
T1swl	~~	T1swl		1	0			1	1
T1achstriv	~~	T1achstriv		1	0			1	1
T1flow	~~	T1flow		1	0			1	1
T2swl				1.232	.465	2.650	.008	.321	2.143
T2flow				2.055	.556	3.693	.0002	.964	3.146
T2achstriv				1.718	.416	4.132	.00004	.903	2.533
T1swl				3.332	.160	20.779	0	3.018	3.647
T1achstriv				5.385	.190	28.373	0	5.013	5.757
T1flow				5.007	.271	18.497	0	4.476	5.537
cohort	~~	cohort		1	0			1	1
cohort	~~	T1School		.124	.054	2.321	.020	.019	.229
T1School	~~	T1School		1	0			1	1
cohort				2.868	.029	98.063	0	2.811	2.926
T1School				.917	.049	18.533	0	.820	1.014
cohort	~~	T2swl		-.052	.075	-.692	.489	-.199	.095

T1School	~~	T2swl		-.067	.066	-1.011	.312	-.196	.062
cohort	~~	T2flow		.066	.080	.835	.404	-.089	.222
T1School	~~	T2flow		.070	.070	1.011	.312	-.066	.207
cohort	~~	T2achstriv		.043	.066	.654	.513	-.086	.172
T1School	~~	T2achstriv		.008	.066	.124	.902	-.122	.138
cohort	~~	T1swl		-.015	.055	-.268	.789	-.123	.094
T1School	~~	T1swl		.042	.054	.779	.436	-.064	.148
cohort	~~	T1achstriv		.019	.050	.382	.703	-.079	.118
T1School	~~	T1achstriv		.070	.053	1.320	.187	-.034	.174
cohort	~~	T1flow		.001	.050	.022	.982	-.098	.100
T1School	~~	T1flow		.014	.054	.268	.788	-.091	.120
as.flow.indirect	:=	a1* b1	as.flow.indirect	-.005	.006	-.878	.380	-.017	.006
total	:=	adirect+(a1* b1)	total	.067	.057	1.180	.238	-.044	.179

Table A3

Standardized Coefficients (Cross-Lagged Panel Model 1 SWL and Competence)

lhs	op	rhs	label	est.std	se	z	pvalue	ci.lower	ci.upper
T2swl	~	T1swl		.615	.058	10.664	0	.502	.728
T2swl	~	T1achstriv	adirect	.096	.058	1.647	.099	-.018	.210
T2swl	~	T1comp	b1	-.083	.067	-1.238	.216	-.214	.048
T2comp	~	T1comp		.243	.102	2.388	.017	.044	.442
T2comp	~	T1achstriv	a1	.120	.084	1.424	.155	-.045	.284
T2achstriv	~	T1achstriv		.653	.054	12.183	0	.548	.759
T1swl	~~	T1comp		.232	.054	4.308	.00002	.127	.338
T1swl	~~	T1achstriv		.293	.051	5.776	0	.194	.393
T1achstriv	~~	T1comp		.388	.067	5.819	0	.258	.519
T2swl	~~	T2comp		.168	.110	1.525	.127	-.048	.384
T2swl	~~	T2achstriv		.190	.107	1.778	.075	-.019	.399
T2comp	~~	T2achstriv		.360	.092	3.917	.0001	.180	.540
T2swl	~~	T2swl		.601	.067	8.941	0	.469	.733
T2comp	~~	T2comp		.904	.053	17.087	0	.801	1.008
T2achstriv	~~	T2achstriv		.573	.070	8.175	0	.436	.710
T1swl	~~	T1swl		1	0			1	1
T1achstriv	~~	T1achstriv		1	0			1	1
T1comp	~~	T1comp		1	0			1	1
T2swl				1.185	.454	2.612	.009	.296	2.074
T2comp				2.544	.519	4.907	0.00000	1.528	3.561
T2achstriv				1.711	.417	4.099	.00004	.893	2.528
T1swl				3.333	.160	20.768	0	3.018	3.647
T1achstriv				5.387	.190	28.383	0	5.015	5.759
T1comp				5.980	.433	13.825	0	5.132	6.827
cohort	~~	cohort		1	0			1	1
cohort	~~	T1School		.124	.054	2.318	.020	.019	.229
T1School	~~	T1School		1	0			1	1
cohort				2.868	.029	97.822	0	2.811	2.926
T1School				.917	.049	18.530	0	.820	1.014
cohort	~~	T2swl		-.045	.074	-.613	.540	-.190	.099

T1School	~~	T2swl		-.070	.066	-1.055	.291	-.200	.060
cohort	~~	T2comp		-.046	.084	-.549	.583	-.210	.118
T1School	~~	T2comp		-.016	.066	-.239	.811	-.145	.113
cohort	~~	T2achstriv		.052	.066	.778	.437	-.078	.182
T1School	~~	T2achstriv		-.004	.067	-.058	.954	-.135	.127
cohort	~~	T1swl		-.017	.056	-.298	.765	-.126	.093
T1School	~~	T1swl		.043	.055	.784	.433	-.064	.150
cohort	~~	T1achstriv		.019	.050	.370	.711	-.080	.117
T1School	~~	T1achstriv		.069	.053	1.303	.192	-.035	.174
cohort	~~	T1comp		-.013	.053	-.250	.803	-.117	.091
T1School	~~	T1comp		.049	.053	.926	.355	-.055	.153
as.comp.indirect	:=	a1* b1	as.comp.indirect	-.010	.011	-.911	.362	-.031	.011
total	:=	adirect+(a1* b1)	total	.086	.056	1.543	.123	-.023	.195

Table A4

Standardized Coefficients (Cross-Lagged Panel Model 2 EWB and Flow)

lhs	op	rhs	label	est.std	se	z	pvalue	ci.lower	ci.upper
T2ewb	~	T1ewb		.537	.060	8.924	0	.419	.655
T2ewb	~	T1achstriv	adirect	.039	.062	.628	.530	-.083	.161
T2ewb	~	T1flow	b1	-.052	.058	-.904	.366	-.165	.061
T2flow	~	T1flow		.438	.077	5.663	0	.286	.590
T2flow	~	T1achstriv	a1	.067	.066	1.007	.314	-.063	.196
T2achstriv	~	T1achstriv		.656	.053	12.272	0	.551	.761
T1ewb	~~	T1flow		.147	.058	2.550	.011	.034	.260
T1ewb	~~	T1achstriv		.353	.050	7.066	0	.255	.451
T1achstriv	~~	T1flow		.076	.062	1.227	.220	-.045	.198
T2ewb	~~	T2flow		.291	.108	2.689	.007	.079	.503
T2ewb	~~	T2achstriv		.284	.089	3.188	.001	.109	.458
T2flow	~~	T2achstriv		.168	.116	1.446	.148	-.060	.395
T2ewb	~~	T2ewb		.701	.061	11.442	0	.581	.821
T2flow	~~	T2flow		.799	.072	11.100	0	.658	.940
T2achstriv	~~	T2achstriv		.569	.070	8.112	0	.432	.707
T1ewb	~~	T1ewb		1	0			1	1
T1achstriv	~~	T1achstriv		1	0			1	1
T1flow	~~	T1flow		1	0			1	1
T2ewb				1.207	.473	2.555	.011	.281	2.134
T2flow				2.069	.555	3.730	.0002	.982	3.156
T2achstriv				1.719	.417	4.121	.00004	.901	2.536
T1ewb				3.142	.154	20.386	0	2.840	3.444
T1achstriv				5.384	.190	28.375	0	5.012	5.756
T1flow				5.007	.271	18.497	0	4.476	5.537
cohort	~~	cohort		1	0			1	1
cohort	~~	T1School		.125	.054	2.323	.020	.019	.230
T1School	~~	T1School		1	0			1	1
cohort				2.869	.029	98.031	0	2.811	2.926
T1School				.917	.049	18.527	0	.820	1.014
cohort	~~	T2ewb		-.028	.075	-.373	.709	-.176	.119

T1School	~~	T2ewb		-.013	.067	-.189	.850	-.144	.119
cohort	~~	T2flow		.066	.080	.824	.410	-.090	.222
T1School	~~	T2flow		.070	.070	1.003	.316	-.067	.207
cohort	~~	T2achstriv		.042	.065	.642	.521	-.086	.170
T1School	~~	T2achstriv		.013	.067	.193	.847	-.119	.145
cohort	~~	T1ewb		.009	.054	.166	.869	-.098	.116
T1School	~~	T1ewb		-.013	.054	-.236	.813	-.119	.094
cohort	~~	T1achstriv		.019	.050	.386	.699	-.079	.118
T1School	~~	T1achstriv		.071	.053	1.327	.185	-.034	.175
cohort	~~	T1flow		.001	.050	.026	.979	-.097	.100
T1School	~~	T1flow		.014	.054	.264	.792	-.091	.119
as.flow.indirect	:=	a1* b1	as.flow.indirect	-.003	.004	-.784	.433	-.012	.005
total	:=	adirect+(a1* b1)	total	.036	.062	.576	.564	-.086	.157

Table A5

Standardized Coefficients (Cross-Lagged Panel Model 2 EWB and Competence)

lhs	op	rhs	label	est.std	se	z	pvalue	ci.lower	ci.upper
T2ewb	~	T1ewb		.524	.063	8.335	0	.401	.648
T2ewb	~	T1achstriv	adirect	.040	.067	.599	.549	-.091	.170
T2ewb	~	T1comp	b1	-.001	.075	-.007	.994	-.148	.147
T2comp	~	T1comp		.242	.101	2.398	.016	.044	.439
T2comp	~	T1achstriv	a1	.120	.084	1.434	.152	-.044	.284
T2achstriv	~	T1achstriv		.648	.055	11.689	0	.539	.756
T1ewb	~~	T1comp		.200	.061	3.260	.001	.080	.320
T1ewb	~~	T1achstriv		.352	.050	7.038	0	.254	.450
T1achstriv	~~	T1comp		.388	.067	5.812	0	.257	.519
T2ewb	~~	T2comp		.270	.109	2.479	.013	.057	.484
T2ewb	~~	T2achstriv		.310	.089	3.493	.0005	.136	.485
T2comp	~~	T2achstriv		.384	.093	4.115	.00004	.201	.567
T2ewb	~~	T2ewb		.709	.065	10.969	0	.582	.835
T2comp	~~	T2comp		.905	.053	17.157	0	.801	1.008
T2achstriv	~~	T2achstriv		.580	.072	8.080	0	.440	.721
T1ewb	~~	T1ewb		1	0			1	1
T1achstriv	~~	T1achstriv		1	0			1	1
T1comp	~~	T1comp		1	0			1	1
T2ewb				1.003	.495	2.026	.043	.033	1.973
T2comp				2.547	.521	4.886	0.00000	1.526	3.569
T2achstriv				1.705	.419	4.069	.00005	.884	2.527
T1ewb				3.139	.155	20.288	0	2.836	3.443
T1achstriv				5.387	.190	28.384	0	5.015	5.759
T1comp				5.980	.433	13.825	0	5.132	6.827
cohort	~~	cohort		1	0			1	1
cohort	~~	T1School		.125	.054	2.325	.020	.020	.230
T1School	~~	T1School		1	0			1	1
cohort				2.869	.029	97.966	0	2.811	2.926
T1School				.917	.049	18.532	0	.820	1.014
cohort	~~	T2ewb		-.022	.075	-.298	.766	-.169	.124

T1School	~~	T2ewb		-.010	.067	-.147	.883	-.142	.122
cohort	~~	T2comp		-.046	.084	-.552	.581	-.211	.118
T1School	~~	T2comp		-.013	.066	-.200	.842	-.143	.117
cohort	~~	T2achstriv		.050	.066	.762	.446	-.079	.180
T1School	~~	T2achstriv		.001	.067	.020	.984	-.131	.133
cohort	~~	T1ewb		.007	.054	.132	.895	-.100	.114
T1School	~~	T1ewb		-.014	.055	-.256	.798	-.122	.094
cohort	~~	T1achstriv		.019	.050	.374	.709	-.080	.118
T1School	~~	T1achstriv		.070	.053	1.309	.191	-.035	.174
cohort	~~	T1comp		-.013	.053	-.246	.805	-.117	.091
T1School	~~	T1comp		.049	.053	.921	.357	-.055	.153
as.comp.indirect	:=	a1* b1	as.comp.indirect	-.0001	.009	-.007	.994	-.018	.018
total	:=	adirect+(a1* b1)	total	.040	.064	.620	.535	-.086	.166

Appendix C: Word Cloud of Open-Ended Data

The open-ended data on personal projects (Chapter 4 and 6) and personally expressive activities (Chapter 8) were visualized using word clouds (Figures A3 and A4). In the original studies, the open-ended data were thematically coded into types. Here, the raw open-ended data is used. As the personal project data represent three projects per participant, the data were organized in long format, with three rows for each participant (one for each of the three personal projects, $N_{projets}$ = 400). There was one personally expressive activity per participant ($N_{activities}$ = 900). The two sets of activity data (i.e., personal projects and personally expressive activities) were separately pasted into an online word cloud generator (Rocket Source Innovation Labs, n.d.). Larger words represent more frequently used words.

Figure A3

Personal Projects Reported in Chapter 6

Note. N = 900 cases.

Figure A4

Personally Expressive Activities Reported in Chapter 8

Note. $N = 400$ cases.

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SPRINGER NATURE

Relative Importance of Individual and Community Predictors of Wellbeing

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